# CLINICAL AND EPIDEMIOLOGICAL CONSIDERATIONS ON HERPES SIMPLEX GENITAL INFECTIONS

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# REZUMAT

Herpesul genital, o infecție sexuală tratabilă, dar incurabilă, cauzată mai frecvent de tipul 2 de virus herpetic (HSV2), este o problemă majoră de sănătate, afectând un procent mare din populația activă. Obiectivele studiului au fost cunoașterea datelor de seroprevalență specifică față de virusul herpes simplex tip 2 la femei active sexual care se prezintă la ambulatoriul de specialitate, identificarea comportamentelor la risc, stadializarea Papanicolau, cu scopul aplicării unor intervenții adecvate de control și prevenție atât la nivel individual cât și populațional. A fost investigat un lot de 224 femei, iar metodele utilizate au fost ELISA pentru serologia IgG și IgM și testul Papanicolau, fiecare femeie completând și un scurt chestionar. Seroprevalența IgG HSV 2 a fost de 51,8%, iar IgM HSV de 6,26%. Un procent mare din cazuri nu au putut descrie un episod acut în antecedente(93,4%), iar dintre cazurile cu IgM pozitiv doar 14,3% au prezentat simptomatologie caracteristică infecției herpetice. Testul Papanicolau a evidențiat clasa II în 78,6% din cazuri, dovedindu-se o relație cauzală semnificativă ststistic între acest stadiu și prezența anticorpilor IgG (OR= 3,35, 1,60< OR< 7,09; RR= 1,99, 1,26< RR< 3,14; p=0,0004). Dintre factorii de risc au fost evidențiați numărul de parteneri(OR = 2,12, 1,17< OR< 3,85; RR= 1,41, 1,10< RR< 1,80; p=0,008) și utilizarea redusă a mijloacelor de protecție (doar 30,36% utilizează constant prezervativul). In concluzie, rezultatele studiului arată că este necesară o monitorizare constantă a morbidității, a factorilor de risc și eficienței tratamentului, în vederea unor intervenții adecvate atât la nivel individual, cât și populațional.

Cuvinte cheie: herpes genital, test Papanicolau, factori de risc

# ABSTRACT

Genital herpes, a treatable but, at present, incurable sexually transmitted infection usually caused by herpes simplex virus type 2 (HSV2), is a major public health threat, affecting a high percentage of the sexually active population. The objectives of the study were the detection of the seroprevalence of antibodies to HSV-2 as one way to estimate the prevalence of genital herpes in a population, high risk behaviors estimation, analysis of Pap test result, for a better control and prevention strategies implementation. We investigated 224 women, using ELISA method for serology and Pap test. All the women filled in a short questionnaire. The seroprevalence of IgG antibodies against HSV 2 was 51.8% and IgM was positive in 6.26% of cases. Risk of transmission is associated with frequency of asymptomatic viral shedding, 93.4% of women with IgG antibodies had no clinical signs in the past and only 14.3% of IgM positives cases had an acute symptomatic genital herpes. The Pap test results showed the stage 2 in 78.6 % of patients and 88% of IgG HSV 2 positives cases (OR= 3.35 1.60< OR< 7.09; RR= 1.99, 1.26< RR< 3.14; p=0.0004). Factors associated with HSV-2 seroprevalence include age, number of sexual partners (OR = 2.12, 1.17< OR< 3.85; RR= 1.41, 1.10< RR< 1.80; p=0.008) and lack of condom use (the regular use of condom is present in only 30.36 % of cases). In conclusion, a continue surveillance in the general and specific populations, the risky behaviors evaluation, the evaluation of the effectiveness of suppressive therapy in preventing spread of infection are very important tools for designing effective interventions.

Keywords: genital herpes, Papanicolau test, risk factors

#### **Abbreviations:**

STD – sexually transmitted diseases; HSV 1- herpes simplex virus type 1; HSV 2– herpes simplex virus type 2; IgG - immunoglobulin G; IgM- immunoglobulin M; OR-odds ratio.

#### **INTRODUCTION**

Sexually transmitted infections (STDs) represent an important public health problem, due to their repercussions on population, as well as on individual health. The diverse etiology, varied evolution, but also the presence or absence of therapeutic means, makes these diseases sometimes hard to control in terms of secondary and tertiary prophylaxis. On the other hand, due to the common transmission route, these diseases may be prevented, with many available prevention methods. Any prophylactic strategy must be based upon a good knowledge of morbidity data. evolution trends and factors which influence the epidemiologic process of these infections.

In this study, one of the most frequent viral sexual infections, affecting both the health of the couple and that of the newborn, has been approached.

Herpes is an infectious disease, caused by type 1 or 2 herpes simplex viruses, characterized by persistent and latent infection, with multiple reactivation clinically, episodes, and, by varied manifestations, from infections localized in different tissues and organs to generalized Genital herpes, caused by type 2 herpes. virus, is a major health problem, global data showing that at least 5% of fertile age women reported a clinical history of genital herpes infection, 30% of these women have positive serologic tests for type 2 herpes virus, and 2% of women become infected during pregnancy [1]. Every year, in the USA, estimates of 1500 - 2000 cases in newborns are recorded [2]. The frequency of congenital HSV 2 infections is considered to be of 1 case in 2000-5000 births. [3]. In most cases, the infection is transmitted during birth, when the foetus passes through the cervical channel. During the first weeks of pregnancy, infection may be associated with abortion. Infections occurring later in the course of pregnancy may cause microcephaly or hydro-anencephaly and (microphtalmy, ocular lesions keratoconjunctivitis and retinitis). Effects have been described both in the case of primary and reactivated infections. In our country, few data exist on the prevalence of the infection in fertile age women or in the general population.

#### **OBJECTIVES**

1. Assessment of specific IgM and IgG antibodies to type 2 herpes simplex virus in sexually active women addressing obstetrics-gynecology services.

2. Clinical-epidemiologic analysis of cases with positive serology

3. Evaluation of Papanicolaou test pathological findings in women with positive serology

4. Analysis of risk behaviors in the investigated population

# MATERIAL AND METHOD

A total of 224 fertile age women who addressed the obstetrics and gynecology outpatient department have been investigated. Each person filled in a short questionnaire and biological samples for serologic and Papanicolaou tests were collected.

IgG and IgM antibodies to type 2 herpes simplex virus were tested using ELISA tests with kits produced by Human. Enzyme immunoassays which detect specific serum anti-HSV 1 and 2 IgM and IgG antibodies are only useful for diagnosing primary infection. IgG antibodies persist for long periods. In cases of reactivation, the titers of specific antibodies show uncharacteristic changes (undetectable levels), for which reason they do not have a practical diagnostic value. Serologic diagnosis is useful for the screening of chronic infections. The disease is frequently detected, over 90% of the adult population having antibodies to type 1 herpetic infection and between 25-50% to type 2 herpes virus. [4].

# RESULTS

The average age of the investigated group was 27.7 years (minimum 16, maximum 54 years).

Single women were predominant (Table 1).

Marital status	Number	Percent
Married	58	25.9
Single	138	61.6
Other	28	12.5

Table 1. Marital status

The most frequent age group was 20-24 years, followed by 25-34 years (Figure 1).



Figure 1. Age group distribution of the investigated women

The results of serological testing for IgG and IgM antibodies show a 6.26% prevalence of recent infections and 51.8% of past infections (Table 2). Of the 14 cases with positive IgM tests, only 2 had typical

herpes lesions (14.3%), the rest being asymptomatic.

Of the 121 cases of past herpes virus infections, only 8 cases reported histories of one or more genital herpes eruption episodes (6.6%).

	Number of positive cases	% positive cases
IgM HSV 2	14	6.26
IgG HSV 2	116	51.8

Table 2.	Prevalence of IgG	and IgM anti-type	2 herpes virus antibodies

Detection of IgM antibodies is useful for confirmation of an active infection; it is clinically significant especially for the diagnosis of neonatal infection and herpetic encephalitis.

The analysis of the number of sexual partners during the last 2 years shows a percent of 68.3 with a single partner and 37.9 with 2 or more partners (Table 3).

Table 3. Number of sexual partners during the last 2 years

Number of	Number of	% out of total
partners	cases	
0	6	2.7
1	133	59.4
2	67	29.9
3 or more	18	8

The comparative analysis of IgG positive cases with one, two or more sexual partners shows a statistically significant difference (OR=2.12, 1.17<OR<3.85; RR=1.41, 1.10<RR±1.80; p=0.008) (2x2 table) (Table 4).

Table 4. The comparative analysis of IgG positive cases with one, two or mo	ore sexual
partners	

	IgG	IgG
	HSV 2 +	HSV 2 -
1 partner	60	73
2 or more partners	54	31

Medical histories of the investigated women reveal that a high percent do not constantly use condoms, fact which may facilitate the transmission of sexual infections. A relatively high percent of cases had at least one abortion and around 44% of the investigated women used contraceptives (Figure 2). Smoking may be a factor influencing fertility and health in women

and children, the percent of smokers among women being high (31.25%).



Figure 2. Proportion of risk factors recorded in medical histories of the investigated women

The analysis of Papanicolaou tests shows 78% of women with class II smears. This

test is essential for the follow up of cervical cancer early lesions (Table 5).

Stage	Number of	% of total
	cases	
Class I	43	19.20
Class II	176	78.57
Class III	4	1.78
Class IV	1	0.45
Total	224	100

Table 5. Cytological results of the Papanicolaou test

Class II smears are significantly associated with positive tests for IgG HSV 2 (OR=3.35, 1.60 < OR< 7.09; RR= 1.99, 1.26< RR< 3.14; p=0.0004) (2x2 table) (Table 6).

Table 6.	<b>Class</b> I	I smears are	significantly	associated wi	th positive	tests for <b>I</b>	gG HS	V 2
			······································					

	IgG +	IgG -
Papanicolaou Class II	102	74
Papanicolaou Class I, III, IV	14	34

Other infections detected with tests performed in women with genital symptoms are presented in Table 7.

Type of infection	Number of	% of total
	cases	
Trichomonas	34	15.18
vaginalis		
Chlamydia	54	24.11
trachomatis		
Candida	46	20.53
Total	134	59.82

 Table 7. Number and prevalence of sexually transmitted infections in the investigated

 group

We must state that 13.8% of the women had multiple, associated infections.

## DISCUSSIONS

Screening for HSV IgG is usually performed only in pregnant women with high risk Serologic factors. tests may identify exposure but thev cannot maternal discriminate between the presence of active disease and asymptomatic carrier state, nor have they predictive value on the risk of preor intra-partum transmission of the virus. Present recommendations indicate caesarean section only in pregnant women with active lesions at the moment of birth.

Testing for antibodies against herpes virus is widely used at transplantation centers, in bone marrow donors and receivers.

The high prevalence of type 2 HSV IgG in the studied group (51%) is explained by the fact that tests were performed in women who addressed the obstetrics-gynecology clinic with various clinical symptoms. Literature data show a rather high variation of seroprevalence figures from one country to another, with higher levels in the USA (13-40%) than in Europe (13-40%), higher values being recorded in high risk groups and also in African-Americans as compared to Caucasians [5].

performed USA Studies in the on representative population samples, showed a proportion of 22% positive cases for type 2 of the virus in persons over the age of 12. Between 80 and 90% of cases did not have clinical symptoms, the lack of awareness contributing to the silent transmission of this sexual infection. At present, herpes infection is considered to be on the first place in the USA, followed by Papilloma and Chlamydia infections [6].

From 1988 until 1994, HSV-2 prevalence in 12 year olds in the United States was 21.9% (95% confidence interval, 20.2 - 23.6%), corresponding to 45 million infected among non-institutionalized individuals. Seroprevalence is higher in women (25.6%) as compared to men (17.8%) and in African-Americans (45.9%) as compared to White individuals (17.6%). Less than 10% of all seropositives had a history of genital herpes. In a multivariate model, independent risk factors for HSV-2 seropositivity were female gender, black race or Mexicanethnicity, American older age, low educational level, poverty, cocaine addiction and multiple sexual partners. As compared the period 1976-1980, during the to following years HSV-2 seroprevalence increased by 30% (95% confidence interval, 15.8-45.8%) [5]. Annually, around 500.000-700.000 new cases are recorded, and the

total number of infected individuals is estimated at 50 millions [7].

Risk analysis shows a statistically significant relation between IgG and the number of sexual partners. Literature data show that the strongest predictor for infection is the number of lifetime sexual partners [8]. The inconstant use of condoms, even during sexual relations inside a couple, increases the risk of HSV infections. Women have a 4 times higher infection risk than men, even at an identical exposure level [9].

The absence of symptomatology contributes to the silent transmission of the virus. The results of this study show that only 6.6% of persons with histories of infection are able to describe an acute eruptive episode. Many times, the disease is not recognized, being confounded with other sexually transmitted (Candida, Chlamydia, infections etc.). Infected persons have an average of 4 recurrences a year after the first episode, but there are variations. Type 2 herpes simplex virus causes 6 times more relapses than the type 1 of the virus.

In parallel with microbiological investigations, the Papanicolaou test is important, as the causal relation between certain viral infections and genital cancer has been documented. Class II Pap smears were significantly associated with the presence of type 2 HSV IgG.

The surveillance of antiviral therapy efficiency represents one of the present concerns in the field. According to recent data, Acyclovir does not decrease HSV-1 transmission in sexually active women and men with genital herpes. [10].

# CONCLUSIONS

1. Seroprevalence of type 2 HSV IgG in the studied population was 51.8%, higher than in the general population, due to group characteristics (presence of symptomatology, age, etc.).

2. Seroprevalence of type 2 HSV IgM was 6.26%, acute infection symptomatology being present in only 14% of cases.

3. The absence of symptomatology in most cases leads to the silent transmission of the virus, an increased incidence being observed in many countries during recent years.

4. Identified risk factors for the infection were the number of sexual partners, age, inconstant use of protective means.

5. Due to long term consequences, the constant monitoring of morbidity, risk factors and treatment efficiency is important.

6. Surveillance priorities are studies performed on population groups with high transmission risk, evaluation of neonatal transmission, determination of initial episode and relapses rates, evaluation of treatment efficiency in the prevention of transmission and recurrences.

# REFERENCES

- 1. Mandell G.L., Benett L.E., Dolin J., 2000, Principles and practice of infectious diseases, 5th ed, 1564-1575
- 2. Corey L, Wald A., 1999, Genital herpes. Sexually Transmitted Diseases,; 3rd ed. NY, 285-312
- 3. Wald A. et al., 1995, N Engl J Med., 333: 705-713

- 4. Cates W Jr., 1999, Sex Transm Dis., 26 (suppl 4): S2-S7
- Nahmias A.J., & Roizman B., Infection with herpes-simplex viruses 1 and 2. New England Journal of Medicine, 289, 667-674, 719-725, 781-789
- 6. Fleming D.T. et al., 1997, Herpes simplex virus type 2 in the United States 1976 to 1994. N Engl J Med., 337: 1105-1111

- 7. Xu F., Schillinger J.A., Sternberg M.R., Johnson R.E., Lee F.K., Nahmias A.J., et al., 2002, Seroprevalence and coinfection with herpes simplex virus type 1 and type 2 in the United States, 1988-1994. J Infect Dis, 185:1019-24
- 8. Corey L., Handsfield HH., 2000, Genital herpes and public health: addressing a global problem. JAMA, 283:791-4
- Bryson Y., Dillon M., Bernstein, D.I., Radolf J., Zakowski P., & Garratty E., 1993, Risk of acquisition of genital herpes simplex virus type 2 in sex partners of persons with genital herpes: A prospective couple study. Journal of Infectious Diseases, 167, 942-946.
- 10. Celum C., Wald A., 2008, The HPTN 039 Protocol Team, Lancet, 371: 2109-19

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# HERGHELIA LIFESTYLE STUDY – AN OPEN LABEL RANDOMIZED CLINICAL TRIAL. CHALLANGES RELATED TO THE DESIGN OF LIFESTYLE CHANGE INTERVENTIONS

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# REZUMAT

Scopul studiului Herghelia Lifestyle Study (HLS) a constat în evaluarea eficienței programului de schimbare a stilului de viață de la Centrul Lifestyle Herghelia, Mureş. Participanții au fost recrutați și randomizați din 3 întreprinderi din Tg. Mureş. Grupul Tratament a participat la programul de 11 zile promovat de Centrul Lifestyle Herghelia (CLH), iar Grupul Martor a primit îngrijiri medicale obișnuite. Datele clinice și demografice au fost culese: la start, la 10 zile, 45 zile, 6 luni și la 1 an. Articolul de față discută amănuntele procesului de selecție și randomizare într-un trial nou ca domeniu (programe rezidențiale de prevenție și lifestyle) cât și problemele ridicate de faptul că tipul studiului (open label) cu tratamentul administrat deschis a crescut șansa unei posibile "contaminări" între cele două grupe cât și șansa unei devieri spre ipoteza nulă. Experiența și observațiile noastre pot ajuta în viitor la designul mai adecvat al studiilor similare.

*Cuvinte cheie*: schimbarea stilului de viață, randomizare, eroare sistematică, design de studiu, recrutare

# ABSTRACT

The aim of Herghelia Lifestyle Study was to evaluate the effectiveness of a residential lifestyle change program at Herghelia Lifestyle Center, Mures County, Romania. The participants have been recruited and randomized from 3 businesses from Targu Mures area. The Treatment group participated in an 11 day program promoted by the Herghelia Lifestyle Center and the Control group received usual medical care. Demographic and clinical data were obtained at baseline, day 10, day 45, at 6 months and 1 year. This paper discuss the details of the selection and randomization process in a novel area (residential preventive lifestyle programs) and also the challenges raised by the fact that the open label randomized

clinical study increased the chance of contamination between the two groups and thus the chance to bias the results both toward and away from the null hypothesis. Our experience and results may help others to do a better job in designing similar studies in the future.

Keywords: lifestyle change, randomization, systematic error, study design, recruiting,

# **INTRODUCTION**

Although evidence based medical recommendations [1-7] pinpoint changes in the lifestyle and health related behavior to be a omnipresent approach to chronic diseases such as cardiovascular disease, obesity and diabetes, lifestyle intervention and modification is not considered a priority and does not have political and adequate budget support nor facilities from insurance companies in order assure to the implementation of these recommendations. Romania is no exception to this situation; proportional mortality with а from cardiovascular disease of almost 60%, with increasing prevalence of obesity and diabetes, Romania continues to be a Cinderella: the prevention programs do not meet the necessary visibility and success. Interventions aimed to reduce major risk factors (cholesterol, hypertension, sedentary behavior, smoking, diabetes, obesity) and other risk factors (homocistein, C reactive protein) involved in the pathogenesis of coronary diseases and/or diabetes proved to be efficient at a clinical level and population level by reducing the rates of morbidity and mortality [8,9].

Antibiotics were the right solution for Current epidemics infectious epidemics. (cardio-vascular disease, obesity, diabetes) require a new approach. Well performed clinical trials [10,11] are demonstrating that regardless the fact that in the medical education and the clinical medical practice (including primary medical care) the accent is stressed on the drug therapies schemes, lifestyle modification must became a constant (even if it is uncomfortable) for the medical approach of the chronic diseases of civilization. The permanent unilateral help for the patient is long overdue - a new approach is required towards the involvement of the patient in her/his own health problems (joint venture) [12]. The thoughts expressed by Abraham Lincoln, are true even when talking about the prevention of chronic diseases: "you are not really and permanently helping people when you are doing for them what they should do for themselves".

Herghelia Lifestyle Center (HLC) was created as an answer to the above stated problems. HLC is a non-profit medical structure where we are trying to approach the chronic diseases of civilization, focusing on prevention and the promotion of a healthy lifestyle (the program was described by Dr. Gh. Nandris as being "the only program from Romania with 50 beds for years of activity prevention). In 13 impressive results were obtained by the patients in the short time (11 day) of exposure to our program. [13]. An observational study at HLC between 1997 and 2000 evaluated 500 patients which consecutively requested our services and which had at least two major factors of cardiovascular risk (one of which was the cholesterol> 200 mg/dl) with an admission period of 11 days, with biochemical and anthropometric evaluation at baseline and after 10 days. The specific medication for dyslipidemia, type II diabetes, ischemic cardiac disease and hypertension was kept at the same level or was reduced (most of the cases) - anyway, the medication was not increased during their stay with us. After 10 days the total cholesterol decreased on average with 25% (it is well known that for each mg/dl of cholesterol lowering the risk of myocardial infarction is reduced by 2-3%) [14,15]. Even for those who had a total cholesterol value between 180- 200 mg/dl, the total cholesterol decreased on average with 20%. HDL cholesterol increased on average 17%. LDL cholesterol decreased on average 29% and the triglycerides decreased 26%.

In order to assure the efficacy of the lifestyle change program at HLC, to assure the internal and external validation we performed a pilot randomized clinical trial between January 2006 and January 2007. In this study we tried to sort out potential problems which may be generated by self selection and hand-picking bias (systematic errors). The question was: can it be that the outstanding results obtained in our Lifestyle program might be due to the influence of the two systematic errors mentioned above, and another question related was, if the intervention in general population which does not apply to lifestyle change programs from different reasons, would have the same results as those observed in patients which came voluntary to Herghelia.

# OBJECTIVES AND PURPOSE OF STUDY

The purpose of this study is to analyze the effects of the health program promoted at HLC on important indicators of health status, including, but not limiting at effort capacity, body weight, smoking, arterial hypertension, blood glucose, cholesterol and triglycerides, reactive protein C, etc. Specifically, the study was aimed to

underline the changes in different measures of health status and the risk evolution in patients enrolled in the Herghelia program when compared with the evolution of the same factors in patients that are following usual medical care.

Our hypothesis was that the Herghelia program has the same influence in general population as in the patients who voluntarily services solicited our and that the outstanding anthropometric and biochemical outcomes are not caused by the biases mentioned (self-selection and hand-picking) but are determined by the program itself. The null hypothesis was that after the intervention there will be no statistically significant differences regarding the studied parameters and the results obtained prior on the patients that solicited the services of Herghelia could be caused by systematic errors.

# MATERIALS AND METHODS

# The selection of participants

The population group in which the randomization was performed consisted of the working force of 3 factories from Targu Mures area. To each employee, a questionnaire was given at the workplace (inclusion criteria was the condition to be employed at the factory) (Annex 1 and 2).

# Annex 1. Initial questionnaire for cardiovascular risk evaluation, page 1

Dear employee,

Herghelia Lifestyle Center, from Herghelia, Ceuaşu de Câmpie commune, Mureş County, România is recruiting volunteers for a research study aimed to measure the effects on health of the lifestyle change program promoted by this institution.

If you are interested to be a part of this research project, please complete the following questionnaire as satisfactory as possible. Please keep in mind the following aspects:

1. The entire information solicited by the form will be confidential. No personal information will be made public. No personal information will be given to the employer. The general, statistical information will be published in a scientific journal.

2. Your participation in the study is not guaranteed after the completion of the form. The information obtained will help the physicians to make adequate selection of study participants.

3. If you will be accepted for participation, all important details of study will be revealed to you in terms of what can you expect from the study as a participant. You can refuse to participate in the study at any moment without any consequences.

4. Shortly after the form will be completed you will be contacted and asked if you want to volunteer in this study, or, you will be told that, for the moment, you do not accomplish the necessary conditions to participate.

For details regarding the project fell free to contact Dr. Nicolae Dan, Herghelia. Telephone 0265-324010

Once again: all information provided by yourself will be kept strictly confidential

Name\_\_\_\_\_ Employ number (code)

# Annex 2. Herghelia Evaluation Form: Health and Lifestyle, Initial questionnaire page 2



11. Were For how	you diagnosed by a physicia long did vou have that cond	n with the ition:	following d	liseases? If	yes, please write
	0	<1 vear	1-5 vea	ars	5-10 years
Α.	Cancer	[]1	[]	2	[]3
Β.	Instable Angina	[]1	[]	2	[]3
С.	Systemic cardiac disease	[]1	[]2		[]3
D.	Diabetes	[]1	[]	2	[]3
Ε.	Hypertension	[]1	[]	2	[]3
F.	High cholesterol	[]1	[]	2	[]3
G.	Major Depressive Disorde	r[]ı	[]:	2	[]3
12. Were Mark the	your mother or father affect suiting variants:	ed by one	of the follow	ving diseas	es?
	_	1	ata	Mam a	
	Cancer		[ ]a	[ ] <sub>g</sub>	
	Instabile Angina		[]₀	[]h	
	Systemic cardiac disease		[]。	[ ]i	
	Diabetes		[ ]a	[ ] <sub>j</sub>	
	Hypertension		[]e	[ ]k	
	Depressive disorder		[ ]f	[]ı	

The study exclusion criteria were: severe physical handicaps (palsies, amputations, etc), those who are planning to retire during the following year, those diagnosed with cancer or instable angina. The questionnaire allowed the gathering of information regarding physical activity, body mass index, high cholesterol value, diabetes or high blood pressure or other diseases known by the patient from personal medical history or family medical history.

Each risk factor received a score from the questionnaire and the subjects were

classified after the obtained score. All subjects had signed the Informed Consent Form and were classified in the decreasing order of risk score. The randomization was performed by a computer starting with the patients with maximum risk and heading towards the patients with minimum risk. The treatment group (Treatment group) came to Herghelia for a 11 days program at HLC and the Control Group were evaluated without changing their daily routine (Study Design scheme – Figure 1)





Figure 1. Study Design scheme

# Technical information. The followed parameters

The study began on January 3rd 2006 continued for a year and pursued the following parameters: total blood cholesterol, HDL cholesterol and the fraction total cholesterol/ HDL cholesterol, LDL cholesterol, triglycerides, heart rate, body weight, body mass index, waist circumference, hips circumference, reactive protein C, systolic and diastolic blood pressure, blood glucose, pain.

The samplings, the clinical interviews and the anthropometric measuring were taken by the medical personnel of HLC, which were trained in standardized international methods for taking the blood pressure, body circumferences, pulse, blood sampling. Measuring and sampling were taken at the beginning, in the 10th day, at 45 days, at 6 months and after 1 year. Also, detailed questionnaires were applied regarding healthy behaviors at the beginning, after one month and a half, after 6 months and after 1 year. Biological samples (blood and urine) were analyzed at the Central Laboratory of Targu the Mures County Hospital (Automatic Analyzer Aeroset Abbott-Toshiba). The statistic calculation revealed that the most important parameters from both groups were not statistically different, so the randomization was correctly performed (Table 1). There were some statistic differences of the diastolic blood pressure of the two groups (increases in control group) and the ratio waist/hip (increased in treatment group). For the comparison of both groups we used Student's t test with p correspondent values and Mann-Whitney U test (significant threshold p < 0.05) working with SPSS v16 software.

1	9
	1

 Table 1. Comparative statistic data at start for the groups Treatment (Test) and Control

Demographic	Control (n=49)	Treatment (n=49)	p-value	p-value
Variables	N±SD (Range)	N±SD (Range)	for t test	for MW
Age	44.5 ± 8.2 (22- 57)	46.4 ± 10.3 (23-79)	0.312	0.510
Sex				
Male	21 (42.9)	19 (38.8)		
Female	28 (57.1)	30 (61.2)	0.681 <sup>a</sup>	0.681 <sup>a</sup>
Baseline Clinical Values				
Weight (kg)	79.5 ± 14.9 (43- 119)	79.5 ± 15.8 (56-123)	0.982	0.765
Height (cm)	$166.5 \pm 10.0$ (141-186)	165.1± 9.5 (139 - 184)	0.458	0.572
Abdominal Circumference	93.3 ± 10.7 (72- 118)	98.3 ± 14.3 (86-127)	0.054	0.145
Hip Circumference	105.6 ± 9.5 (88- 127)	105.7 ± 9.5 (86-127)	0.924	0.923
Waist/Hip Ratio	$\begin{array}{rrrr} 0.88 & \pm & 0.07 \\ (0.77\text{-}1.01) \end{array}$	$0.93 \pm 0.09 (0.71 - 1.09)$	0.008*	0.009*
SystolicBloodPressure	105.6 ± 9.5 (88- 127)	105.7 ± 9.5 (86-127)	0.211	0.056
Diastolic Blood Pressure	87.2 ± 12.1 (50- 114)	81.9 ± 11.9 (60-110)	0.030*	0.014*
Blood Sugar	$100.16 \pm 8.46$ (84-130)	$105.68 \pm 25.38$ (76.4-216)	0.158	0.729
Cholesterol	$236.26 \pm 46.6 (141.9-349)$	$237.78 \pm 49.96$ (152.4-341)	0.871	0.907

Triglycerides	$149.80 \pm 14.80$	118.98 ± 56.33 (55-	0.114	0.165
	(33.6-114)	275)		
HDL	$58.00 \pm 14.80$	55.35 ± 13.05 (37.1	0.348	0.365
	(33.6 – 114)	- 110.9)		
LDL	$148.30 \pm 44.24$	158.64 ± 37.39 (93-	0.214	0.268
	(3.9-239.4)	231.2)		
Heart Rate	99.29 ± 15.44	94.20 ± 12.26 (68-	0.081	0.089
	(71-152)	121.6)		
Pain	5.24 ± 3.16 (0-	5.30 ± 3.31 (0-10)	0.932	0.819
	10)			

#### Data collection and analysis

Data was recorded on data collection forms and then double entered into a database for subsequent data summary and analysis. Demographic and between and within-group changes in clinical values and assessed health risk practices were made using standard statistical techniques.

A sample size of 50 participants in each group will provide enough statistical power (80%) to detect a 15% within-group change in mean serum cholesterol, and a 50% between-group difference in change. Additionally, 50 participants are about the maximum that Herghelia can manage in a single session.

All related protocols study (patient recruitment. risk/benefits of analysis, Informed Consent Form were revised and approved by Loma Linda University Institutional Review Board and the Ethics Committee of Medical Collegiums Cluj before the study begun. All participants entered the study after they received a detailed description of the research study and after each participant had signed the Informed Consent Form. Those who

assigned to the control group received the results of blood analysis after each examination and were advised to contact the family physician or occupational physician if their values were out of range.

## **Intervention methods**

The Herghelia Health Center and Preventive Medicine (opened for patients since 1996, with over 10.000 patients admitted so far), operates in sessions of 11 days, with fixed days for start. The patients follow a program focused on health education with strategies of modification of risk behavior involved in the genesis of atherosclerosis, coronary disease, diabetes and obesity.

Major interventions can be classified into 5 categories: diet (low-fat, high fiber, with 20-23 % of total calories from lipids, rich in vegetables, legumes, fruits, nuts, seeds and whole cereals, rich content in dietary fibers), aerobic physical exercise, physiotherapy (massage, hydrotherapy, etc.), behavior change, stress management.

The NEWSTART (c) program for lifestyle change used at Herghelia focused on the 6 major risk factors for coronary disease and much more. Half of the program at Herghelia is educational, targeting lifestyle change: anti-stress seminar, medical smoking cessation program, seminars. weight management program, hypertension management, type 2 diabetes management program, NEWSTART presentations and anti-atherogenic nutrition/cooking. Three of 6 hours of the daily "treatment" program are dedicated to healthy lifestyle education.

# **DISCUSSION**

The design of an open label, randomized clinical trial in the field of Lifestyle Medicine is new, as the specialty (American College of Lifestyle Medicine [16] - is reuniting physicians of a new medical specialty - Lifestyle Medicine which was founded by American Medical Association in 2004). There are only a few trials in this field, especially when we consider the residential life-style change programs). The great majority of residential programs are observational. and. when randomized clinical trials were performed, they were done in ambulatory conditions. Due to the novelty of this type of residential trial it is worth to discuss some issues that this clinical trial it had raised.

#### 1. Problems regarding open label randomization, study design and systematic errors

Standard design of randomized clinical trials was established by the drug research that allow hiding a small quantity of active component in a base of starch and glucose that makes the placebo drug to look the same as active drug. So, the patients from a randomized clinical trial can be placed in the control group or treatment group without knowing which one received the active substance. If the medical personnel know which is the group that receives the active substance we have a blinded study, but if the medical personnel do not know which group receives the active substance we have a

double blind trial. It is difficult to extrapolate clinical trials about drugs to a lifestyle change intervention and we must know that there will be systematic error in both ways. This is due to the fact that one group has to change diet, physical activity, etc. in a direction that everybody knows that this will be the healthy life style. Everybody knows that the physical activity is important for health, all know that a healthy natural diet, less processed, with plenty of vegetables and fruits is healthier. Because the treatment group is trained and then behavior changes are demanded, the participants of this group know that they are the treatment group. On the other hand, the necessity that all the research ethical codes to be respected, makes the remittance of the details of the intervention imperative before the Informed Consent is signed. This knowledge can influence the performance of the test and control groups: either towards distancing from the null hypothesis or approaching to it. Even in the case of a trial that is following the specific contribution of one factor (for example: the treatment group must change diet and do physical exercises while the control group just changes the diet - the trial aiming for finding the specific contribution of physical exercise) there is a possibility that both groups to think that they are the treatment group, and each of the groups having the tendency to limit all behavior with impact on health, moving the trial results close to the null hypothesis.

On the other hand, to be able to eliminate the confounding factors it is recommended that both groups to be selected from the same population, same exposures, same living and working conditions. This is the situation for our study, in which the participants were selected amongst the employees of three factories. Each subject hoped that they will be in the treatment group for a free ride, but some of them found themselves later in the Control Group.

We were aware that, in general, the employees/workers have a better health

status than the people un-employed (healthy worker effect), but we considered that the effect of this systematic error resolve not head our results towards the working hypothesis but towards the null hypothesis. But, if in this context where there are tendencies of influencing the results towards the null hypothesis some significant differences appear between the two groups, the chances are that the positive results of intervention to be validated.

We kept in mind the fact that all participants were chosen from the same factory and a contamination between the two groups could be possible because the participants from Treatment group could communicate with the participants from the control group and give details about the intervention and behavior changes from HLC (less fat, cereals and integral bread, the calories repartition throughout the day) and so, the Treatment group could have better results on blood tests and anthropometric measures if the control group would have not received these information. The contamination could influence the results towards a null difference between the two groups. After we had performed the statistical analysis, we realized that probably we had quite a bit of contamination in our groups. In the Treatment group there were significant differences between the initial data and the data collected at 10 days, 45 days, 6 months and 1 year; although there were statistical differences between the two group at 10 days, and after 45 days at the most of the studied parameters there were no longer significant differences between the groups (the evolution curves were similar to the control group).

Because the participants had come to Herghelia as a group, it was obvious that a study was implied. There was also the possibility to bring the participants at different timing during the year. The first reason why we had chosen to bring the participants as a group was the timing. The beginning of a new year is the period of time when the employs have more free time and can participate in the study. We could have brought the participants throughout the year but this would increase considerably the time of the study and the costs. To compensate this, comparative studies were performed between the Treatment group and other groups of patients participating in the program. Per global, we considered that the tendency of results to get closer to the null hypothesis were more powerful than the tendency of results to get closer to our working hypothesis.

## 2. Financial Problems

One of the reasons why randomized residential clinical trials were avoided by other centers is high cost. From the Loma Linda University estimations, the cost of this clinical trial, performed in volunteering condition by Romanians and Americans was just a fraction from the costs performed in the industrialized countries. Study design had to take into account the financial limitations. Ideally, to eliminate systematic errors we should have chosen besides the 2 groups, a third one, (a second control group), selected after same criteria, from a similar factory but not from one of the three selected in this study, so the confounding effect could be minimized. Also, in order to eliminate the healthy worker effect a comparison group from general population would have been useful. All of these would have meant a more generous study fund. It is then remarkable the fact that the necessary amount of money was found in order to perform this study as mentioned.

# 3. Problems regarding the conflict of interest

At the moment, there are discussions regarding the impact of the conflict of interest in medical practice and in research [17]. Important journals from several universities are making requests to the physicians and researchers to mention the affiliation or the relationship to the drug industry [18]. Most of the trials are funded by the pharmaceutical industry and there is a

considerable pressure for positive results: the trials are the final step of a very complicated and expensive process by which each drug is put on the market. Positive results mean an open gate to market the product and to recuperate the investment and make profit because is no secret that this is why the industry is operating. Because the program tested in our trial is the one we offer to the patient in the last 13 years a conflict of interest may arise.

We want to demonstrate that what we are offering is worth buying and a tendency for subjectivism for the research phenomena still exists. On the other hand it is difficult to conduct experiments in other circumstances because there are few centers of this kind. Public Health, Preventive Medicine, the health education and the change of lifestyle do not have the attractivity and financial resources of other medical specialties or pharmaceutical research, so it is hard to imagine another scenario, but the one that we have had in this study: volunteering. We have tried to minimize the confounding by requesting consultancy from Loma Linda University, a university with tradition in clinical trials on lifestyle.

## 4. Ethical problems

It is not easy to study the apparent obvious things. Although the popular wisdom intuitively believed in the benefits of physical exercise for coronary disease, a lot of years had passed, and after smoking, high blood cholesterol and hypertension, in the 1990s the lack of physical exercise was declared a major risk factor. This behavior was intuitive related to the heart's health and had to be long studied in order to receive this status, based on evidence.

Our study proposed to measure the impact of a lifestyle most people believe is healthy but it was never measured in terms of the contribution of each element to the general outcome. We regarded our work as a pilot trial, as a departure point for other studies. We wish to better understand the specific contributions of each element from Herghelia program.

We would like specially to quantify the contribution of health education to the outstanding results. We would like to redo our study with three groups: the first Treatment group will be enrolled in the full Herghelia program, the second Treatment group will receive the Herghelia program minus the educational program (they will receive the diet from Herghelia, they will have a nutritional and a physiotherapy program but no one will explain to them the importance of the risk factors that led to the chronic diseases they are suffering, no one will explain the role of nutrition and why is being used that specific diet -a situation similar to the general set up in the regular health care system today.

Here there is an ethical issue: is it ethical to retain something for which there is no evidence based data that it has a contribution to healing or rapid reduction of cardiovascular risk factors, but all intuitively think health education and promotion is a positive element in the treatment and control of the chronic diseases. So far we do not specific know the and quantitative contribution of health education and promotion in reducing the cardiovascular risk.

As a matter of fact, a similar problem appeared in the pilot study: to ban the communication between the Treatment group and the control group, to forbid the transmittal of information regarding the health education or not. We have left this to the participants' decision, because for the most of elements offered at Herghelia there are sufficient evidences (fibers and integral bread reduces the risk of coronary disease, and reduces the cholesterol, decreases the blood glucose and the physical exercise reduces the blood glucose and the risk of coronary disease).

# CONCLUSIONS

We are expecting that the results of this study to contribute to a better design of randomized clinical trials in the field of residential preventive medicine. The randomization was performed in good conditions – the comparative statistical data between the two groups did not evoked significant differences, both groups being similar at start.

Because the subjects had signed an Informed Consent where the details of the intervention were presented it was hard to cover the fact that the group which participated in the program from Herghelia was the Treatment group that generated perhaps better results than in the subjects that usually came to Herghelia. This phenomenon influenced the results by distancing from the null hypothesis.

The control group was aware that the group will not be enrolled in an intervention as the Treatment group and due to the fact that the groups were formed by employs from the same factories compensation and a contamination phenomenon could have happened influencing the results by distancing from the null hypothesis.

# REFERENCES

- 1. Mosca L., et al., 2007, Expert Panel/Writing GroupEvidence-based guidelines for cardiovascular disease prevention in women: 2007 update. Circulation.2007, Mar. 20;115(11):1481-501. Erratum in. Circulation
- \*\*\*, 2007, European Guidelines on Cardiovascular disease prevention in clinical practice: executive summary. Fourth

The study groups selected from workers have the tendency to have healthy worker effect that can move the results towards the null hypothesis (fewer changes in the parameters of the Treatment group and so smaller differences between test and control groups). Finally, to increase the possibility to be applied in general population, ideally a randomized trial have to be planned from general population with a design that allows quantification of the the specific contribution of various factors of the lifestyle intervention to the significant results obtained during an eleven day residential lifestyle program.

> Joint Task Force of European Society of Cardiology and other Societies on Cardiovascular Disease Prevention in Clinical Practice. European Heart Journal

3.\*\*\*, 2004, American Cancer Society, the American Diabetes Association, and the American Heart Association. Preventing Cancer, Cardiovascular Disease, and Diabetes A Common Agenda for the American Cancer Society, the American Diabetes Association, and the American Heart Association Circulation

- 4 \*\*\* 2007, AHA/AACVPR Scientific Scientific Statement. А Statement From the American Heart Association Exercise, Cardiac Rehabilitation, and Prevention Committee, the Council on Clinical Cardiology; the Councils on Cardiovascular Nursing, Epidemioand Prevention, logy and Nutrition, Physical Activity, and Metabolism; and the American Association of Cardiovascular and Pulmonary Rehabilitation. Core Components of Cardiac Rehabilitation/Secondary Prevention Programs: 2007 Update. Circulation
- 5.\*\*\*, 2003, AHA Scientific Statement. American Heart Association Guidelines for Primary Prevention of Atherosclerotic Cardiovascular Disease Beginning in Childhood Circulation
- 6.\*\*\*, 2006, Diet and Lifestyle Recommendations Revision 2006 A Scientific Statement From the American Heart Association Nutrition Committee Circulation
- 7.\*\*\*, 2006, Preventing Cardiovascular Disease and Diabetes. A Call to Action From the American Diabetes Association and the American Heart Association. Circulation;113:2943-2946. 2006 American Heart Association, Inc.
- 8. Salim Y. at al., 2004, Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART study); 264:937-52

- 9.\*\*\*, 2002, Diabetes Prevention Program Research Group: Reduction in the incidence of type II diabetes with lifestyle intervention or metformin. N Engl J Med 346:393-403
- 10.\*\*\*, 2002, Diabetes Prevention Program Research Group: Reduction in the incidence of type II diabetes with lifestyle intervention or metformin. N Engl J Med 346:393-403
- 11. Uusitupa M. et al:The Finnish Diabetes Prevention Study. Br J Nutr 83 (Suppl 1): S137-S142,2000
- 12.\*\*\*, WHO Alma Ata Declaration, 1978 www.who.int/hpr/NPH/docs/
- declaration\_almaata.pdf accesat la 3 June 2009
- Dan N. et al. Rezultatele activității Centrului de Sănătate la 13 ani de activitate. Viață+Sănătate, vol. 9, nr 3, pag 20-22
- 14. Law M.R., Wald N.J., Thompson S.G. 1994, By how much and how quickly does reduction in serum cholesterol concentration lower risk of ischemic heart disease? BMJ
- 15. Njolstad I., Arnesen E., Lund-Larsen P.G., 1996, Smoking, serum lipids, blood pressure, and sex differences in myocardial infarction. A 12-year followup of the Finnmark Study. Circulation
- 16. \*\*\*, http://www.lifestylemedicine.org/ accesat 3 iunie 2009
- 17. Abbasi and Smith. Editorial, 2003, No more free lunches, BMJ, 326:1155-1156 (31 May), doi:10.1136/bmj.326.7400.115 5
- Miller J.D., 2006, Conflict-of-Interest Spurs New Rules, Not Consensus. JNCI Journal of the National Cancer Institute

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# HERGHELIA LIFESTYLE STUDY – EFFICIENCY OF A REZIDENTIAL LIFESTYLE CHANGE PROGRAM

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### REZUMAT

Herghelia Lifesyle Study a avut ca scop să testeze eficiența programului rezidențial de schimbare a stilului de viață în ce privește modificarea factorilor de risc în boala coronariană, eliminând erori sistematice care au parazitat până acum studiile rezidențiale existente. Grupul Test (N=49) a participat la programul oferit la Herghelia (dietă hipolipidică, abandonarea fumatului, exercițiul moderat, fizioterapie și managementul stresului), iar Grupul Martor (N=49) a continuat rutina zilnică. După 10 zile au existat diferențe semnificative statistic în ce privește modificarea factorilor de risc cardiovascular în favoarea lotului Test: colesterolul total, LDL, greutatea corporală, circumferința abdominală, IMC (p<0,001), glicemia (p<0,018), dar nu s-au constatat diferențe semnificative în ce privește frecvența cardiacă, raportul colesterol total/HDL, tensiunea arterială sistolică și diastolică. În concluzie, intervenții intensive multifactoriale de genul celor de la Herghelia par a fi validate de studiul prezent și se pare că pot avea un impact major și la nivelul populației în general prin scăderea semnificativă a factorilor de risc majori pentru boli cronice comune cum ar fi boala coronariană, diabetul și obezitatea.

*Cuvinte cheie*: *stil de viață, intervenții multifactoriale, boala coronariană, colesterol, glicemie* 

#### ABSTRACT

Herghelia Lifestyle Study aimed to test the effectiveness of a residential lifestyle change program in modifying CHD risk factors by trying to eliminate the biases existing in the residential studies done until now. The Treatment group (N=49) participated in the program we offer at Herghelia (low fat diet, stop smoking, moderate exercise, physiotherapy, stress management) and the Control group (N=49) continued with their daily routine and usual care. After 10 days there was a statistically significant decrease of most of the CHD risk factors in the Treatment group when compared with the Control group: the changes were highly significant (p<0.001) for total cholesterol, LDL cholesterol, body weight, waist circumference, BMI and glycemia (p<0.018) but we didn't find statistically significant differences for heart rate, total cholesterol/HDL ratio, systolic and diastolic blood pressure. Conclusion: this study seems to validate multi-factorial lifestyle interventions like the one offered at Herghelia Lifestyle Center and it seems that they also can have a major impact on general population through lowering significantly the major risk factors for chronic diseases like CHD, diabetes and obesity.

Keywords: lifestyle, multi-factorial interventions, CHD, cholesterol, glycemia.

#### **INTRODUCTION**

Preliminary data from the Programul Național de Evaluare a Stării de Sănătate a Populației din România (The National Program for the Evaluation of the Health Status of Romanian Population) indicate that our country is confronted with a raising in the incidence of diabetes, obesity (even in children), hypertension, cancer, coronary dyslipidemia disease. heart while consumption of tobacco and alcohol remain a Public Health challenge. For example, in Cluj only, "144.648 people have an increased risk for diabetes, 26.028 have high risk for cardiovascular diseases and over 10.000 are at risk for uterine cancer. This program evaluated 380.000 people in Cluj and the most frequent test recommended by the family physicians was glycemia".

Regarding cardiovascular diseases which are the first cause of death in Romania, the major modifiable risk factors for coronary heart disease (CHD) are almost all from the sphere of someone's lifestyle whether we are talking of increased cholesterol, lack of physical exercise, smoking or hypertension, obesity and diabetes. It is not by chance that in European Community and USA the common message of the guides for the management of the Cardiovascular Diseases (CVD) is a prevention oriented lifestyle.

In 2006 American Heart Association and American Diabetes Association issued a common Call to Action, saying: "Both the American Heart Association and the American Diabetes Association remain jointly committed to a reduction in heart disease, stroke, and new-onset diabetes. We strongly recommend that all providers assess patients for their global risk for CVD and diabetes. Despite many unresolved scientific issues, a number of cardio metabolic risk factors have been clearly shown to be closely related to diabetes and CVD: fasting/postprandial hyperglycemia, overweight/obesity, elevated systolic and diastolic blood pressure, and dyslipidemia. Although pharmacologic therapy is often indicated when overt disease is detected, in the early stages of these conditions, lifestyle modification with attention to weight loss and physical activity may well be sufficient.

It must be remembered that obesity is far more than an unattractive appearance but can be prevented. Moreover, it is often a visible marker of other underlying risk factors that can be addressed. Thus, the overweight or obese patient deserves major clinical attention. The growing prevalence of this condition threatens to undermine all of our recent gains to prevent and control chronic disease." Public Health and Primary Care play an important role in prevention, early detection and treatment of these diseases of modern civilization through health education and promotion.

At the Herghelia Lifestyle Center we are taking seriously this call to address and reduce the risk factors just mentioned by integrating our lifestyle change program with the usual Primary Care and/or clinical work. With Herghelia Lifestyle Study we tried to show that through lifestyle change there could be a fast and significant impact in lowering the common risk factors for the major chronic diseases we fight in Romania (CVD, diabetes, obesity) through lifestyle change. Also, our results suggest that the influence of these changes can extend beyond personal life to coworkers, friends and most probably impact the family of provenience.

To study the efficiency of the residential lifestyle change program at Herghelia Lifestyle Center (HLC) we have done a pilot randomized clinical study from January 2006 to January 2007.

# TRIAL OBJECTIVES AND PURPOSE

The purpose of this study is to assess the results of Herghelia's live-in program on salient measures of health including but not limited to changes in weight, smoking, blood pressure, blood sugar, blood triglycerides, exercise etc. Specifically, the study seeks to compare changes in clinical health measures and health risk in participants who experience the Herghelia live-in program with comparable participants who receive standard medical care.

The working hypothesis was that the Herghelia program has same impact in the general population (general applicability) like in the subpopulation of patients who came as patients at Herghelia in the last 13 years and the remarkable results were not due to the hand picking and self-selection biases.

Secondly, we were interested in the history of lifestyle change and relapse. From this standpoint we would have liked to have more resources to make more frequent measurements to identify which is the most susceptible period in term of relapse in the treatment group. It is important to know if and when is this susceptible, critical time in the history of lifestyle change because with a minimum of resources we could support patients pointedly to continue with the healthy lifestyle.

# **STUDY DESIGN**

The selection, randomization and description data of participants has been published in a previous article.

# **METHODS**

The treatment group underwent a multifactorial, intensive intervention including: special formulated plant based

diet. physical exercise, stop smoking program (approved by the Societatea Română de Cardiologie (the Romanian for Cardiology), Society weight management, daily stress management program, blood pressure management program, diabetes management, counseling and group therapy.

#### Diet and exercise

The diet and the exercise program have been the key elements of our program. The diet served at Herghelia and to the treatment group was specially formulated for the prevention and treatment of chronic diseases of civilization and contain between 1600 and 2150 calories a day, according with the person's needs. Fats provide 21-23% of total calories (saturated fats less than 5%, monounsaturated fats 5%, polyunsaturated fats 11-13%, with an average of 3.8 g of the omega 3 linolenic fatty acid daily. Carbohydrates provide 66% of the daily calories with the majority of them being complex carbohydrates from whole wheat bread, whole cereals bringing about 50 grams of fibers daily. The protein in the diet gives about 12-13% of total calories. The diet does not contain cholesterol and is rich in vitamins (Beta-carotene, B1, B3, B6, C, E and folic acid) and minerals (MG, Fe, K, Selenium) as well as a multitude of phytochemicals.

With respect to exercise the treatment group participated in about 2.5 hours of aerobic physical exercise: 30 minutes of weak up exercise in the morning, 1 hour mobility exercise and 1 hour of supervised walking with the intensity of this physical exercise from 2 to 6 METS.

The whole intervention program at Herghelia was elaborated in accordance with the WHO recommendation for the global management of the risk of CVD: "OMS recommends a global approach of the management of the CVD risk rather than isolated measures against smoking, high blood pressure etc. Without doubt smoking

is the leading risk factor, followed by the high blood pressure, cholesterol, obesity, a low intake of fruits and vegetables, and physical inactivity."

The variables measured were: Total HDL cholesterol. cholesterol. LDL cholesterol, triglycerides, heart rate, BMI, abdominal circumference, abdominal/waist circumference ratio, Systolic blood pressure, Diastolic blood pressure, glycemia, pain. Blood samples were sent to an external laboratory for analysis. We estimated before the study that a sample size of about 50 participants in each group will provide enough statistical power (80%) to detect a 15% within-group change in mean serum cholesterol, and a 50% between-group difference in change. Additionally, 50 participants are about the maximum that Herghelia can manage in a single session.

Data have been recorded on data collection forms and then double entered into a database for subsequent data summary and analysis. Demographic and between and within-group changes in clinical values and assessed health risk practices were made using standard statistical techniques.

Statistical data were analyzed with the help of SPSS v16 program.

# RESULTS

Table 1 shows the baseline and day 10 Mean and Standard Deviation data.

Group		Ν	Minimum	Maximum	Mean	Std. Deviation
1 Treatment	WT1	48	56.0	123.0	79.563	15.9533
	WT10	48	55.0	120.0	78.056	15.3782
	ABD1	47	75.0	135.0	97.723	13.5626
	ABD10	46	71.0	126.0	92.946	12.1336
	Hip1	47	86.0	127.0	105.447	9.2450
	Hip10	47	81.0	125.0	103.830	9.6077
	SBP1	48	92	200	133.79	21.382
	SBP10	47	95	156	116.57	14.423
	DBP1	48	60	110	81.31	11.329
	DBP10	47	58	90	72.74	8.292
	BS1 Baseline Blood Sugar	47	76.4	216.0	105.862	25.6266
	BS10 10-day Blood Sugar	47	63.5	141.2	80.034	14.8410
	CHOL1	48	152.4	341.0	237.655	46.4351
	Chol10	47	105.6	240.0	164.015	32.4950
	TG1	48	55.0	275.0	120.037	56.4284
	TG10	47	37.1	289.2	96.690	53.1316
	HDL1	48	37.1	110.9	55.283	13.1836
	HDL10	47	27.4	55.1	40.528	7.0807
	LDL1	48	93.0	231.2	158.365	37.7368
	LDL10	47	54.9	157.0	104.149	24.5780
	BMI1	48	19.96	41.10	29.0692	4.95352
	BMI10	48	20.31	40.09	28.5219	4.75995
	Valid N (listwise)	45				
2 Control	WT1	49	43.0	119.0	79.539	14.8740
	WT10	49	48.0	117.4	79.702	14.7596
	ABD1	49	72.0	118.0	93.347	10.7482
	ABD10	48	68.5	118.0	93.500	12.2713
	Hip1	49	88.0	127.0	105.551	9.4914

Table 1. Baseline and 10 days mean and SD

					-
Hip10	48	90.0	128.0	104.885	8.8692
SBP1	49	78	190	140.24	21.170
SBP10	48	92	173	128.40	17.261
DBP1	49	50	114	87.24	12.070
DBP10	48	50	100	78.19	10.418
BS1 Baseline Blood Sugar	49	84.0	130.0	100.163	8.4640
BS10 10-day Blood Sugar	48	64.6	112.5	82.787	10.3363
CHOL1	48	141.9	349.0	236.579	47.0398
Chol10	47	111.0	273.8	199.378	37.5869
TG1	48	54.0	315.0	134.875	65.8279
TG10	47	34.3	214.5	89.191	43.0899
HDL1	48	33.6	114.0	58.301	14.8108
HDL10	47	32.4	99.0	52.961	12.1343
LDL1	48	56.8	239.4	151.303	39.3151
LDL10	47	53.5	195.1	128.579	33.3947
BMI1	49	20.76	40.58	28.6013	4.42493
BMI10	49	21.11	40.35	28.6651	4.34489
Valid N (listwise)	47				

(WT=weight, ABD=abdominal circumference, Hip=hip circumference, SBP=systolic blood pressure, DBP=diastolic blood pressure, CHOL=total cholesterol, TG=triglycerides)

Table 2 presents paired T test for the Treatment group with the corresponding p values being all statistically significant p<0.05. Table 3 presents paired T test for

the Control group with mixed results concerning the p value (some statistically significant changes occurs also in this group).

#### Table 2. Paired T test – Treatment group (day 10 –baseline)

Treatment					
Pair	Mean	Std.	95% Confidence Interval of the		P-
		Deviation	Difference		value
WT10 - WT1	-1.5063	1.5918	-1.9685	-1.0440	.000
ABD10 - ABD1	-4.7444	4.6620	-6.1451	-3.3438	.000
Hip10 - Hip1	-1.3913	3.1215	-2.3183	4643	.004
SBP10 - SBP1	-17.511	19.439	-23.218	-11.803	.000
DBP10 - DBP1	-8.809	11.218	-12.102	-5.515	.000
10-day Blood Sugar - Baseline Blood Sugar	-25.8277	22.6100	-32.4662	-19.1891	.000
Chol10 - CHOL1	-73.1438	28.0426	-81.3774	-64.9102	.000
TG10 - TG1	-20.2417	47.0732	-34.0629	-6.4205	.005
HDL10 - HDL1	-15.0383	9.1717	-17.7312	-12.3454	.000
LDL10 - LDL1	-54.0572	23.5830	-60.9814	-47.1330	.000
BMI10 - BMI1	54732	.54344	70512	38953	.000

#### Table 3. Paired T test – Control group (day 10 –baseline)

Pair	Mean	Std.	95% Confidence Interval of the		P-
		Deviation	Difference		value
WT10 - WT1	.1633	1.6866	3212	.6477	<mark>.501</mark>
ABD10 - ABD1	.5000	4.5535	8222	1.8222	<mark>.451</mark>
Hip10 - Hip1	2396	3.3166	-1.2026	.7235	<mark>.619</mark>
SBP10 - SBP1	-11.854	17.678	-16.987	-6.721	.000
DBP10 - DBP1	-9.000	12.476	-12.623	-5.377	.000
10-day Blood Sugar - Baseline Blood Sugar	- 17.4008	7.6034	-19.6086	-15.1930	.000
Chol10 - CHOL1	- 37.6457	20.9725	-43.8035	-31.4880	.000

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TG10 - TG1	- 44.0540	36.3107	-54.7153	-33.3928	.000
HDL10 - HDL1	-5.7083	5.6563	-7.3691	-4.0475	.000
LDL10 - LDL1	- 23.1266	18.9921	-28.7029	-17.5504	.000
BMI10 - BMI1	.06375	.65306			<mark>.498</mark>

In Figures 1 to 11 we have the graphic description of mean values changes occurred after the 10 day. The Treatment

group has been the object of our intervention while the Control group went about their normal working program and usual care.



Figure 1. Weight







Figure 3. Hip circumference































Figure 11. Body Mass Index

After 10 days there was statistically significant difference between the two groups (Independent t test, p < 0.05) as far as: total cholesterol (p < 0.001) - in the

treatment group the blood cholesterol decrease with 31%; LDLcholesterol(p<0.001) - in the treatment group LDL-cholesterol decreased with 34%;

glycemia (p<0.018) – in the treatment group glycemia decreased on average with 26mg/dl; body weight (p<0.001) – in the treatment group the weight decreased with an average of 1.6 kg; abdominal circumference (p<0.001) – in the treatment group the average drop was 5 cm; BMI with the p<0.001.

Triglycerides dropped statistically significant within both groups but there was no difference when we compared the two groups. Blood pressure both SBP and DBP dropped significantly in both groups but when we compared one against the other there was no statistical difference between them (p>0.05).

# **DISCUSSION**

The first objective of our Herghelia Lifestyle Study was to find out whether the outstanding results obtain in our program over 13 years are not exaggerated or biased by potential hand picking and/ self-selection biases. Our study seems to confirm that major changes in the profile of CHD risk factors may be achieved in a relatively short period of time, as it is in our 11 day program at Herghelia, regardless the target group. The null hypothesis seems to be invalidated by our results but of course other studies of similar programs needs to bring more evidences.

The results achieved through were significant lifestyle improvements, and without registering the slightest side effects, and it seems that these changes may contribute decisively to lower the risk and improving the clinical outlook of conditions like: CHD, diabetes, obesity, dyslipidemia etc. The decrease of the blood cholesterol value is quite impressive - 31% in just 10 days and this in the context of the healthy worker effect. It is true, the decrease might be due to the period of the year when we conducted the study, it was immediately after the Christmas and New Year holydays. It may be that during this holiday season people eat a diet rich in animal fat and concentrated sweets and are more sedentary leading to an increase in blood cholesterol beyond their average value. Also, in the Control group the total cholesterol dropped an average of 15% but because they started from the same value, and the Treatment group had an additional drop of 16% there was a highly statistically significant difference between the two groups.

The HDL seems to be somehow a surprise because we would expect that in the context of a healthy lifestyle it will go up, reflecting an improved lipid profile. There were controversies in the literature over this issue back in the 90's when Dean Ornish published in Lancet The Lifestyle Heart Trial. He showed similar results in a randomized lifestyle trial done in previously diagnosed CHD patients, and the HDL went initially down, too. When we have major drops of the Total blood cholesterol it is expected that the HDL-cholesterol will drop, too. LDL and HDL are part of the total cholesterol value and it is expected when registering massive and rapid change in total cholesterol and LDL-cholesterol to see drops in HDL cholesterol. In fact, we should rather look at the change of the C-T/HDL which according with the risk ratio equations derived from the Framingham Study is predictive of CHD risk (when the value of the ratio is 3.4 signifies just 50% of average risk; 5.1 means average risk; 6.8 means doubled risk and 7.8 signify tripled risk - for men and for women the corresponding values are 2.5; 4.4; 6.4 and 7.5). In the Treatment group the C-T/HDL ratio went from 4.2 at baseline to 4 at day 10 and went down to 3.4 in the 45th day of the study which reflects a decrease of the risk for CHD despite the decrease in HDL. The Control group also had this ratio decrease from 4 to 3.75 by day 10 and to 3.37 by day 45. There is no data showing that a decrease of the HDL in the framework of a low fat diet is detrimental to health or increase the risk for disease.

A reduced HDL induced by a low fat, high complex carbohydrates diet does not confer same CHD risk in Americans like a reduced level of HDL due to high fat diet consumption.

The drop in HDL cholesterol by eating a low fat diet results in an increased HDL clearance and a decrease of the HDL apoprotein transport. Populations with a habitual low fat diet who have a decreased HDL don't show an increase in CHD. It is a known fact that:

- Stop smoking decrease the risk for myocardial infarct (MI) between 50-
- Decreasing cholesterol by 1% we
- Decreasing cholesterol by 1% we decrease the risk for MI with 2-3%
- Exercising regularly decrease the risk for MI with 45%
- Decreasing the weight to a healthy weight in obese people decrease the risk for MI with 35-55%
- Reducing the blood pressure with 1mmHg will decrease the risk for MI with 2-3%

Thus the results obtained at Herghelia Lifestyle Center in a relative short time can have an impact comparable or even better than that obtained through drug approaches only, if the lifestyle changes may be maintained over time, as demonstrated in The Lifestyle Heart Trial where the patients in the Treatment group maintained the positive gains at the 5 year check up. The Herghelia Lifestyle Study suggest the possibility to use lifestyle therapies not only for prevention purposes but also as part of the therapeutic plan for fighting chronic diseases like CHD, diabetes and obesity.

# CONCLUSION

The Herghelia Lifestyle Study and data accumulated over 13 years of experience at Herghelia Lifestyle Center show that:

1. The lifestyle change program at Herghelia (including a plant based diet) seem to have

the same positive results in a general working population like the results obtained by the patients coming voluntarily to our program. A major reduction in the major CHD risk factors may be obtained through a multi-factorial lifestyle intervention in a relatively short period of time, in the general working population.

2. The inference that the noteworthy results obtained in a residential lifestyle change program might be attributed to self-selection and hand-picking bias seems to be invalidated by our results. Our study suggests that the results obtain at Herghelia during the past 13 years of activity might be applied also to the general population (or at least to the general working population) and particularly to those of them having a high risk for/or those already having: CHD, diabetes and obesity. The results obtained at Herghelia Lifestyle Center offer food for thought regarding the need of placing a bigger emphasis on the behavioral change interventions focused on behaviors which place a major proportion of Romania's population at risk for cardiovascular diseases, diabetes and obesity.

3. While for a smaller fraction of the population might be proper a drastic diet like the therapeutic one served at Herghelia, we need to propose for the majority of the population more realistic diets, somewhere between 24% and 30% calories coming from fat (however, from 24% down we can speak about regression of atherosclerosis in case of those with CHD, at 30% the atherosclerotic plaque is progressing still!)

Diet plays an important role in: 4. atherogenesis, in the interplay of blood lipids and lipids handling enzymes like LPL, in the obesity gene modeling, in the glucose intolerance insulin and resistance. with the Interheart According Study. regardless geography and ethnicity 50% of MI can be attributed to diet (that is half of all MI). The rest of 40% are due to exercise and other lifestyle modulated variable with only 10% of the risk factors being nonmodifiable. For all these reason a Herghelia type diet might be an important key to

reduce significantly the risk factors for CHD thus reducing the risk for major coronary events. While the Herghelia diet is quite restrictive it might be beneficial for a large part of the population at risk for CHD.

I will end with a fitting thought spoken long before by Alfred Whitehead: "Familiar things happen and mankind does not bother about them. It requires a very unusual mind to undertake the analysis of the obvious." The almost universally popular knowledge that there is a strong link between our lifestyle (and particularly our diet) and a host of chronic disease including CHD is probably one of those familiar things often forgotten and overlooked. European Society of Cardiology and the World

# REFERENCES

- 1.\*\*\*, http://www.clon.ro/stiri/cluj/articol/ 140000-de-clujeni-risca-sa-se-238mbolnaveasca-de-diabetzaharat/cn/news-20081202-10574843 accesat la 26/05/2009
- 2. \*\*\*, European Summit on CVD Prevention - Call for Action: To promote a heart healthy environment in Europe. http://www.escardio.org/Polic y/prevention/initiatives/europe ansummit/Documents/eusummit

2008-call-action.pdf accesat 12/24/2008 11:12 AM

- \*\*\*, 2006, Preventing Cardiovascular Disease and Diabetes. A Call to Action From the American Diabetes Association and the American Heart Association. Circulation, American Heart Association, Inc.
- 4. \*\*\*, 2002, Global approach to health initiatives of importance for the prevention of cardiovascular disease The

- Heart Federation Joint Session. Dr. Derek Yach, WHO director noncommunicable diseases. Sunday, 1 September
- 5. Ornish D. et al., 1990, Can lifestyle changes reverse coronary heart disease? The Lifestyle Heart Trial
- 6. Connor and Connor, Katan, Grundy, Willet, 1997, Should a Low-Fat, High-Carbohydrate Diet Be Recommended for Everyone? Clinical Debate. NEJM, August 21, Number 8 Volume
- 8. Brinton E.A., Eisenberg S., Breslow J.L., 1990, A low-fat diet decreases high density lipoprotein (HDL) cholesterol levels by decreasing HDL apolipoprotein transport rates. J Clin Invest
- 9. Connor W.E., Cerqueira M.T., Connor R.W., Wallace R.B., Malinow M.R., Casdorph H.R., 1978, The plasma lipids, lipoproteins, and diet of the
Tarahumara Indians of Mexico. Am J Clin Nutr

- Knuiman J.T., West C.E., Burema J., 1982, Serum total and high density lipoprotein cholesterol concentrations and body mass index in adult men from 13 countries. Am J Epidemiol 1982;116:631-642.
- 11. Nedley N. 1999, Proof Positive, N&N Publishing, p 83

- 12. Barbard N. 2001, Turn Off the Fat Genes, p12
- 13. Salim Y. at al., 2004, Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART study). Lancet 2004; 264:937-52
- 14. Whitehead, Alfred North, 1925, Science and the Modern World. New York: Macmillan.

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## SHOULD PHYSICIANS CONCEAL CERTAIN TREATMENT OPTIONS FROM THEIR PATIENTS JUST BECAUSE THEY ARE COMPLEX? SHOULD PHYSICIANS BE THE ONLY DECIDER CONCERNING THE BEST TREATMENT OPTION FOR THEIR PATIENTS? PRACTICAL PUBLIC HEALTH ISSUES DRAW FROM HERGHELIA LIFESTYLE STUDY DATA

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### REZUMAT

Există o abundență de date științifice incluzând și cele provenite de la trialul Herghelia Lifestyle Study care indică faptul că expertiza în următoarele domenii: schimbarea stilului de viață și a comportamentului, Educație pentru Sănătate și Promovarea Sănătății, Sănătate Publică (atât cunoștințe cât și viziune) ar trebui să devină parte integrantă a pregătirii medicale a viitoarelor generații de medici care se confruntă cu o creștere fără precedent a ratelor obezității, diabetului și a bolilor cardiovasculare. Conform noii gândiri în ce privește pregătire medicală va fi obligatoriu pentru viitorii medici să aibă viziunea Sănătății Publice în timp ce vor practica o îngrijirea a pacienților focalizată pe prevenție. Intervențiile în zona schimbării comportamentului și a stilului de viață sunt inevitabil legate de confruntare cu bolile cronice și în speță cu bolile coronare. În esență este vorba de nevoia unui proces educațional prin care pacienții înțeleg fiziologia propriului organism și importanța alinierii comportamentului la legile fiziologiei iar medicii învață metode de schimbare a comportamentului și a stilului de viață care vor ajuta pacienții să îmbrățișeze un stil de viață dictat de legile fiziologiei și nu de capriciile obiceiurilor nesănătoase.

*Cuvite cheie*: stil de viață, schimbări comportamentale, boli coronare, pregătire medicală, etică

### ABSTRACT

There is wealth of data including our new data coming from Herghelia Lifestyle Study indicating that lifestyle change and behavioral modification expertise, Health Education and Promotion and getting Public Health vision and knowledge should be part and parcel of medical training for the new generations of physicians facing an unprecedented rise in obesity, cardio-vascular disease and diabetes. According with the new paradigm shift about medical education it will be mandatory for future physicians to have Public Health and Prevention vision while practicing prevention oriented patient care. Interventions in the area of behavior and lifestyle change are inevitably involved in the battle with all chronic disease and particularly with CHD. Essentially, we are talking about the need of an educational process in which patients understand the physiology of their own body and the importance to align their behavior with its laws and physicians learn behavior and lifestyle change methods which are helping patients to embrace a lifestyle dictated by the law of physiology and not by the whim of unhealthy habits.

Keywords: Lifestyle, behavior change, CHD, medical training, ethic

As noted in the articles published in this issue of the journal the positive findings resulted from Herghelia Lifestyle Study converge with the results obtained on almost every group of 40-50 people who come to Herghelia every two weeks for a session. The results of the lifestyle intervention in CHD are impressive, at least as impressive as the latest drug intervention, with the added benefits of no side effects and maybe less expenses for the family budget.

When we compared the outcome at 10 days against the baseline in the Treatment group (paired T test), all variables measured (TC, LDL, HDL, TG, glycemia, abdominal and hip circumference, weight, SBP and DBP, and BMI) where statistical highly significantly lower/improved.

After 10 days there was also statistically significant difference between the two groups for: total cholesterol (p<0.001) - in the treatment group the blood cholesterol decrease with 31%; LDL-cholesterol (p<0.001) - in the treatment group LDL-cholesterol decreased with 34%; glycemia (p<0,018) – in the treatment group glycemia decreased on average with 26mg/dl; body weight (p<0.001) – in the treatment group the weight decreased with an average of 1.6

kg; abdominal circumference (p<0.001) – in the treatment group the average drop was 5 cm; BMI with the p<0.001. Triglycerides drooped statistically significant within both groups but there was no difference when we compared the two groups. Blood pressure both SBP and DBP dropped significantly again in both groups but when we compared one against the other there was no statistical difference between them (p>0.05).

The question when seeing this magnitude of change is obvious: is it possible to extend these results to the general population translating them into general recommendations and guides? If the answer is yes what would be the consequences and if the answer is no what would we lose?

Lifestyle change is and will be always a challenge, even for medical professionals.

Commenting about the attitude of many physicians Dr. Dean Ornish, professor of medicine at the UC San Francisco once said: "It is a very paternalistic attitude to say, 'We know you won't even do it because it's hard.'...The (lifestyle) program is not for everyone, but there is a larger percentage of people interested in following a program like this than many doctors might believe... I don't understand why asking people to eat 44

a well-balanced plant based diet is considered drastic, while it is 'medically conservative' to cut people (hearts) open and put them on cholesterol-lowering drugs for the rest of their lives." Likewise, we could say the same thing concerning many others healthy behaviors: it is not feasible for the XXI century pace to put people on a regular exercise program, or asking them to eat daily a good breakfast, or to sleep 7-8 hours a night; we (physicians) should not ask people to do these because they won't do it.

The familiar mantra of most medical professionals when coming to implementing lifestyle change in a clinical setting is that low fat diet, daily exercise, eating regularly a consistent breakfast are not feasible that's why we should put them on medication and hope they will still stick to it after 2-3 months, although current research shows that people are not more consistent in taking medication á la long then in making lifestyle change á la long. Studies have shown that just 1/3 of the heart disease patients follow their physicians' advice in dealing with: high cholesterol, high blood pressure, lack of exercise and smoking. Incidentally, all these behaviors valuable in preventing and treating CHD seem to be the hallmark of successful maintenance of weight loss (and weight is closely correlated with the risk for diabetes type II). Therefore we are discouraging important behaviors affecting potentially the risk factors for an estimated 60-70% of all cause of death in Romania. In an article published in 2005 by Hill JO et al in the Journal of Nutrition Education and Behavior the researchers comment that:" The National Weight Control Registry (NWCR) consists of over 4800 individuals who have been successful in long-term weight loss maintenance. The purpose of establishing the NWCR was to identify the characteristics of those who common in long-term weight succeed loss maintenance. We found very little similarity in how these individuals lost weight but (we found) some common behaviors in how they are keeping their weight off. To maintain their weight loss NWCR participants report eating a relatively low-fat diet, eating breakfast almost every day, weighing themselves regularly, and engaging in high levels (about 1 hour/day) of physical activity."

I believe that by not telling people what they should do albeit that is not the easy road, when we know what the research is telling us; and by not telling patients that there is hope, there is an ideal treatment for obesity or for CHD (even if they already take drugs for the lately) we might run into ethical issues.

### Lifestyle, medication and ethical issues

It is ethical for a physician consulting and treating a patient to tell him or her all the option, and by the same token it is not ethical (even if it is very frequently done) not to tell patients all the options and to choose (instead letting the patients to choose) to arbitrary leave out some options just because we suppose will be difficult for them to follow those options.

It was a time in the first part of XXth physicians century when in western countries didn't know yet that smoking is dangerous for your health. There were some who even prescribed smoking for certain respiratory conditions. In the same time there were visionary physicians and health advocates who said smoking is poisonous. Those singular voices were not able to curb the use of tobacco which in fact increased in the first part of the century because the majority of physicians didn't think smoking is bad. Time passed, research showed the true face of smoking, in 1964 The Surgeon General's Report on Smoking and Health was a breakthrough and little by little physicians began to tell patients smoking is deleterious to health. Smoking rates went down in the second half of the century (specially after 70') and I imagine that this could have not happen if we would have done all other things like forbid billboards and advertising, not sell to teenagers etc. except the voice of physicians. When physicians are not on board patients will do little to change long cherished habits.

Suppose a physician sees a patient with a rare but dangerous disease and he knows there is a cure for that disease but the medication is very expensive. Will be ethical for the physician to withhold that information about the drug because he supposes the patient will not have the means to purchase it? Does it happen like that? Not really - physician don't hesitate to tell patients about a better drug ( a better statin, a better beta-blocker) or much more about an ideal drug even if it is expensive and/or need to be purchased from oversees. Why then physicians do not realize that is wholly unethical to withhold information from the patients just because we - the physicians together with the pharmaceutical industry, made already the decision for the poor patient: because is too hard for the patients to change their lifestyle concerning eating habits and exercise we won't tell them about this option because they won't do it, so we will give them drugs. I believe in many of these instances the handling of patients is unethical and probably physicians should be accountable when withholding held information concerning all options for treatment.

# Is it possible to implement multi-factorial lifestyle change programs at population level?

Herghelia Lifestyle Study appears to validate the outstanding results obtained in the population subgroup of patients coming at Herghelia over the last 13 years (over 10,000 cases) as applicable to the rest of the population, at least to the working people regardless of age. The puzzling question is: how could we implement multi-factorial lifestyle change programs, similar to the one at Herghelia Lifestyle Center, at the level of general population. Such an effort paid off for Finland, when a county (North-Karelia) was selected where such a program was

conducted, and as a result, by contamination from county to county, Finland is today not anymore a leader in cardiovascular mortality in Europe but it's a leader in prevention. KTL (National Public Health Institute of Finland) is now considered one of the best health institutes in Europe. national Professor Pekka Puska, the young and idealistic then Public Health physician (it was in early 70' when the Karelia Project began) started small with health lectures at the local Old Ladies' Clubs, then he went on television and radio stations and began to work with family physicians at a time when KTL had 3 employees in a small office for Chronic Disease Prevention.. As physicians rallied and the health education and promotion gained momentum while the food industry diversified the health food offer things changed dramatically in North Karelia. When they started Karelia Project the proportion of smoker in North Karelia County was 52% (age group 25-59), the average blood cholesterol was 270ml/dl, and average blood pressure count was 150/92 mm Hg with 34% of people having a SBP over 95mmHg. In an article published by prof. Puska in 2002 he has shown that Karelia Project became a demonstrational project for all the rest of Finland "contaminating" county after county. In 25 years the percentage of smokers dropped to 31%. Before the project started people in Finland would rarely eat vegetables and vegetable oil and 90% of the population used almost exclusively butter on bread. After 25 years vegetables and vegetable oil are common staples and only 7% of the population use exclusively butter on bread. The total cholesterol dropped accordingly on average with 17%. Raised Blood Pressure has been brought down under control and physical exercise increased. In 25 years the annual mortality rate through CHD in male adult population dropped 73%, mortality by pulmonary cancer dropped 70% in Karelia and 60% in Finland. General mortality dropped 45% increasing the lifespan with 7 years for men and 6 years for women.

An independent investigation has shown that the decrease in the mortality by CHD could be mainly explained through change in the risk factors profile (lifestyle change) and that the decrease in blood cholesterol has been the biggest contributor to the positive outcome.

Today KTL has over 400 employees in the Department of Chronic Disease Prevention and is a hub of research known in the entire world. Incidentally Prof. Pekka Puska is the general director of KTL. This success story gives hope that taking the findings of our study to the general population is possible but not easy.

### Why is so hard to copy Karelia model?

In an excellent article published by Harlan and Strosss in JAMA they analyzed the need of a collaborative effort between Public Health and the usual internal and cardiology medical care sector for the prevention of CHD. They analyzed the collaboration between National High Blood Pressure Education Program and the American Heart Association for the National Campaign for Controlling Hypertension in USA between 1960 and 1980 and noted the fact that The National Cholesterol Education Program to prevent CHD needed to be undertaken with a totally different educational approach.

The Campaign for Controlling Hypertension like many other successful Public Health education programs had а verv straightforward educational message leading to simple behaviors: measure annually your blood pressure; if high, seek treatment from physician; your if treated maintain habitually the treatment. The intervention in patient's lifestyle was minimal. The results were quick and visible. By contrast, in The National Cholesterol Education Program, lifestyle related to eating and exercise habits needed to be clearly changed, because there were no evidences that the drug therapy should be used preventively on a large scale. From the beginning of last decade we knew from Oslo Study that there is possible to

change significantly the eating behavior of middle age men with high risk for CHD, with relatively modest effort (specially if the family is also included in the educational effort). Overall the changes obtained in this study were translated into a significant drop of the blood cholesterol which in turn influenced a statistically significant reduction of 46% for the coronary acute events.

However, the majority of physician is not capable to use a dietetic therapy and is not comfortable with other therapies who call the patients to control and maintain a certain lifestyle. They have little experience in applying the principles of behavior change and have little opportunities to monitor their patients (who are undergoing a behavioral therapy) long enough to develop confidence in such a therapy.

Furthermore physicians are not comfortable with behavioral change therapy because success here is marked by small increments and recidivism and failure is common. They feel more comfortable when dealing with absolute terms like: health versus disease, normal versus abnormal, compliance versus non-compliance. This impulsivity and impatience to restore abnormal to normal is rewarded in the competitive pre-med environment and is implemented in the most part of the medical training and residency.

The fact that most of the successful programs like: weight management, stop smoking program, alcohol abstinence (Alcoholics Anonyms) are outside the classical health institutions and rarely use physicians as health vectors tells volumes about the inefficiency of physicians to implement behavioral change.

Lifestyle involves a multitude of variables which make it difficult to come up with a quick and simple message for the public. However, the scientific world need to find consensus about what message it delivers to the world. Harlan and Stross observed that a

critical issue in the above equation is education, education for both population and for medical professionals.

Harlan and Stross proposed in their article that focus of the educational effort for the prevention of CHD should be re-directed first and foremost on...physicians. They suggest that the whole medical training of future students should be designed differently than it is now in order to have physicians deal successfully with the challenges posed by the present epidemics of lifestyle diseases.

# Change in the medical training is on the air but how soon?

Dr. Molly Cooke and al. complain in the New England Journal of Medicine that "Students learn from this culture that health care as a business may threaten medicine as a calling." Physicians are now paid for what they write on the chart, not for what they do for the patient. Physicians seem to be increasingly focused on treatment instead of prevention. In an average 15 minute visit patients explaining their problem to a physician were interrupted after an average of 23 seconds. Fifty percent of patients leave office visits not understanding what the physician has told them. It would take a primary care physician 18 hours per day to provide all recommended preventive and chronic care services to a typical patient panel. As a result, only half of evidencebased care is actually provided. These disturbing findings can be attributed primarily to the overburdened 15-minute clinician visit. The solution described by Dr. Bodenhaimer is chaning primary care into a team-based endeavor, offloading many functions from the 15-minute visit. This is exactly what we do now for 13 years at Herghelia Lifestyle Center.

"The future physician—regardless of specialty field—will need to manage an avalanche of patient-specific data, rapidly changing and ever-progressing scientific information, and new and evolving technology to support both diagnosis and treatment. Key Point: the physician of the future will need to combine high-tech medicine with high-touch caring.... Among those important skills will be the ability to establish trusting relationships with patients, for without trust effective care is impossible. The physician of the future will also have to recognize that professional obligations extend beyond the patients who come to the office or hospital. It will be necessary to take responsibility for the health of the public in their region and begin to become stewards of limited societal resources that must be applied in the most effective ways".

In conclusion: is it possible to extend these results to the general population translating them into recommendations and guides? Well is not only possible but according with the new thinking about reforming medical education it will be mandatory for future physicians to have also Public Health and Prevention vision while practicing patient care. Interventions in the area of behavior and lifestyle change are inevitably involved in the battle with all chronic disease and particularly with CHD. Essentially we are talking about an educational process in which patients understand physiology and its laws and are helped to learn behavior and techniques which are helping them to embrace a lifestyle dictated by the law of physiology and not by the whim of bed habits. The involvement of the physician in healthy behavior promotion is a must because it has a much bigger impact in patients than the involvement of nurses. auxiliary personnel and lay people.

Although the studies evaluating the impact of lifestyle upon the natural history of the CHD are hard to do because technical details like: difficult randomization, weak control, ethical issues, the difficulty to design simple or double blind studies, long term non-compliance, etc; although we cannot completely extrapolate all the results of these study to the general population, these studies are useful suggesting future direction for research, and a promise of a

new and better era for Public Health Education and Health Promotion. Hopefully there will be a day when these Cinderellas will be recognized for their true important role in the Medical Care.

### REFERENCES

- 1. Smith S.C. et al., 1995, Preventing heart attack and death in patients with coronary disease. Circulation, Jul 1; 92(1):2-4
- Hill JO, Wyatt HR, Phelan S, Wing RR., 2005, The National Weight Control Registry: is it useful in helping deal with our obesity epidemic? Journal of Nutrition Education and Behavior, 37, 206-210
- Pekka P, 2002, Successful prevention of non-communicable diseases: 25 year experiences with North Karelia Project in Finland, Public Health Medicine, 4 (1):5-7
- Vartiainen E, Puska P, Pekkanen J. d al., 1994, Changes in risk factor explains changes in mortality from ischemic heart disease in Finland. BM]
- Sanstrom P.H., 2002, Comunicare personală la Herghelia Euroregional Conference on Quit and Win, 2002 for Health Professionals, March 15-17, 2002 Herghelia, Romania
- Harlan W.R., Stross J.K., 1985, An educational view of a national initiative to lower plasma lipid levels. JAMA. 1985 Apr 12; 253(14):2087-90
- 7. Hjermann I. et al., 1981, Effect of diet and smoking intervention on the incidence of CHD: Report

- from the Oslo Study Group of a randomized trial in healthy men. Lancet 1981; 2: 1303-1310
- 8. Cooke M., Irby M.I., William S., Ludmerer K.M., 2006, American Medical Education 100 Years after the Flexner Report September 28, 2006, number 13, volume 355:1339-1344
- 9. Bodenheimer T. 2007, A 63-year-old man with multiple cardiovascular risk factors and poor adherence to treatment plans. JAMA, 298:2048-2055
- 10. Bodenheimer T., 2008, Transforming Practice. The future of primary care. November 13, 2008, Number 20, Volume 359:2086-2089
- 11. Bodenheimer T., 2008, Transforming Practice. The future of primary care. November 13, 2008, Number 20, Volume 359:2086-2089
- 12. Smith G. L., 2008, The future of medical training: Back to basics in a new world, The Journal of Family Practice: Current Clinical Practice October 2008, Vol. 57, No. 10A Suppl: S14-S16
- 13. Kottke T.E., Solberg L.I., Brekke M.L., Conn S.A., Maxwell P., M.J., 1992, Brekke А controlled trial to integrate smoking cessation advice into primary care practice: Doctors Helping Smokers, Round III. J Fam Pract. 1992 Jun; 34(6):701-8

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### MANAGEMENT DATA REGARDING HOSPITALIZATION OF PATIENTS WITH DIGESTIVE DISORDERS

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### REZUMAT

Scop. Evaluarea aspectelor statistice și de management pentru cazurile de boli ale aparatului digestiv, internate la nivel național în anul 2007. Metodologie. Datele monitorizate se referă la toate cazurile externate în plan național, raportate în 2007 la casele de asigurări pentru sănătate. Evaluarea cuprinde mai multe aspecte, printre care: magnitudinea fenomenului, tipurile de boli, împărțirea pe zone, județe, spitale a cazurilor și durata medie de spitalizare. **Rezultate.** La nivel național, internările din această categorie de diagnostic se situează pe locul trei ca număr de cazuri (8% din totalul cazurilor spitalizate). 85% din spitale au avut astfel de cazuri. Aproape jumătate dintre cazuri aparțin la numai 3 grupe de diagnostic (esofagită, gastroenterite, apendicectomie). Majoritatea cazurilor sunt nechirurgicale. Pentru unele spitale patologia digestivă reprezintă o pondere însemnată în structura morbidității spitalizate (în patru spitale bolile digestive reprezintă peste un sfert din cazuistică). O pondere importantă dintre pacienți sunt tineri (o treime au vârsta sub 20 de ani). Marea majoritate a pacienților (93%) sunt vindecați sau ameliorați la externare, mortalitatea fiind mai mică de 1%. Concluzii. Îngrijirile primare de sănătate sunt îngrijiri sanitare esențiale bazate pe metode și tehnologii practice, pertinente din punct de vedere științific și acceptabile din punct de vedere social, făcute să fie accesibile în mod universal indivizilor și familiilor din comunitate, prin totala lor participare și, la un cost pe care comunitatea și țara poate să își permită să îl mențină în fiecare stadiu al dezvoltării lor în spiritul încrederii în sine și al autodeterminării.

*Cuvinte cheie*: management sanitar, boli digestive, spitalizare, mortalitate, morbiditate

### ABSTRACT

**Aim.** Evaluation of management data for patients with digestive disorders, hospitalized in our country in 2007. **Methodology.** Monitored data refers to all hospitalized cases from our country, reported to the health insurance companies in 2007 and statistically evaluated with EpiInfo 6.0. The evaluation involves several aspects, such as: the phenomenon

as volume and complexity, the phenomenon's geographical spread, as the patients place of origin and their hospitalization site, the evaluation of services provided to ensured and nonensured patients, as well as the health insurance provider the patients are enrolled to, the determination of the hospitalized patients' demographical characteristics and of circumstances of hospitalization and discharge of these cases. **Results.** Nationwide, hospitalizations within this diagnosis category occupy third place as number of cases (8% out of total hospitalized cases). Almost half of the cases belong to 3 diagnosis groups (esophagitis, gastroenteritis, appendectomy). The majority of cases are non-surgical. For some hospitals, digestive diseases and disorders represent an increased part in the morbidity structure (in four hospitals digestive diseases totalize over one quarter of cases). An important frequency of patients are young (one third are under 20 years old). The majority of patients (93%) are healed or improving when discharged, mortality being lower than 1%. Conclusions. The primary health care is based on practical methods and technology, scientifically tested and socially accepted, meant to be universally accessible to individuals and families from the community, and at a cost that the community and the country can afford to maintain each stage of development.

*Keywords*: health management, digestive diseases, hospitalization, mortality, morbidity

### **INTRODUCTION**

Digestive disorders are widely spread in the general population, claiming a high place in the general morbidity. Their increased frequency of them in the general pathology, the high disability potential of some, their interaction with environment and nutrition factors raise the need of discovering them at an earlier stage, to treat and prevent the complications [1,2].

One of the necessary conditions in detecting, diagnosing and properly treating these disorders is for the patient to set an appointment with a doctor as soon as the symptoms show, as well as for the regular check-ups of previously diagnosed disorders that need to be monitored in health centers, private clinics, general hospitals and university hospitals' consulting rooms.

Also, it is necessary to know the environment, toxic and nutrition factors that could cause or aggravate these disorders. The noxious effects of alcohol over the stomach, liver, pancreas, of tobacco over the esophagus, stomach, the ulcerous effect of several drugs which could lead to superior digestive hemorrhage, the noxious effects of improperly cooked food, of irregular meal times, stress, impose the knowledge of these factors and their avoidance in the prevention of digestive disorders. We insist upon the necessity of regular check-ups of ailments that need chronic, long-term treatments, the patients being compelled to present themselves at certain periods of time [3-5].

Monitoring of population groups with high risk of digestive cancer (stomach or colon) is one of the most important problems of modern gastroenterology, an early diagnosis of cancer being possible this way, making survivals last a lot longer. Drug abuse or treatment interruption on their own is not allowed. Therefore, a treatment plan recommended by a doctor will be followed, knowing the benefits as well as the inconveniences of these drugs [6].

Our purpose was to evaluate data management for patients with digestive disorders, hospitalized in our country in 2007.

### **MATERIAL AND METHOD**

Monitored data refers to all hospitalized cases from our country by national regulations [7-9], reported to the health insurance companies in 2007 and statistically evaluated with EpiInfo 6.0.

The evaluation involves several aspects, such as:

- the evaluation of phenomenon as volume and complexity
- the determination of the phenomenon's geographical spread, as the patients place of origin and their hospitalization site
- the evaluation of services provided to ensured and non-ensured patients, as well as the health insurance provider the patients are enrolled to
- the determination of the hospitalized patients' demographical characteristics
- the determination of circumstances of hospitalization and discharge of these cases.

We followed analysis by pathological criteria of digestive disorder cases, by organizational, hospitalization/discharge types or demographic criteria.

The analysis concerns all the hospitals in the country, the data being processed by the National Statistics Institute [10].

### RESULTS

The percentage of digestive disorders was 8.53% of all hospitalized cases in 2007 (Table 1), being amongst the last categories as frequency.

Major diagnosis category	Total	Cumulative
Respiratory system diseases and disorders	11.81	11.81
Circulatory system diseases and disorders	10.55	22.36
Digestive system diseases and disorders	8.43	30.79
Pregnancy and birth	8.12	38.91
Musculoskeletal system and connective tissue diseases and disorders	8.01	46.92
Ear, nose, mouth and throat diseases and disorders	6.80	53.72
Nervous system diseases and disorders	6.14	59.86
Liver and pancreas diseases and disorders	5.65	65.51
Urinary system diseases and disorders	4.10	69.61
Skin, subcutaneous and breast diseases and disorders	4.02	73.62

### Table 1. Percentage of digestive disorders out of all hospitalized cases in 2007

#### Analysis by pathological criteria Diagnosis groups (DRG)

A high percentage of esophagitis, gastroenteritis and other digestive disorder cases are notable, totalizing over 30% of hospitalized cases. Appendectomies also have a high incidence (17%).

The majority of hospitalizations belong to non-surgical units.

Out of all main diagnosis, the most frequent ones (a quarter of cases) were:

- acute appendicitis
- unilateral groin hernia, without occlusion or gangrene
- diarrhea and gastro-enteritis (Table 2,3).

Table 2. Frequency of	f digestive disorder cases	according to diagnosis groups
1 1	8	

DRG Name	Total	Cumulative
Esophagitis, gastroenteritis and other digestive disorders, 0-17 years	12.94	12.94
Appendectomy without complications and comorbidities	11.84	24.78
Esophagitis, gastroenteritis and other digestive disorders, >17 years, without complications and comorbidities	10.47	35.26
Esophagitis, gastroenteritis and other digestive disorders, >17 years,	6.86	42.11

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with complications and comorbidities		
Interventions on groin and femoral hernia, >17 years, without complications and comorbidities	6.47	48.58
Annendectomy with complicated main diagnosis, without		
Appendectomy with complicated main diagnosis, without	5.31	53.89
complications and comorbidities		
Other digestive system diagnosis, >17 years, without complications	1 27	58 16
and comorbidities	4.27	56.10
Gastrointestinal hemorrhage, without complications and comorbidities	3.56	61.72
Gastric ulcer, without complications and comorbidities	3.44	65.16
Digestive malignant tumors, without complications	3.14	68.30

Table 3. Cases frequency by main diagnosis

DRG Name	Total	Cumulative
Acute appendicitis	12.08	12.08
Unilateral groin hernia, without occlusion or gangrene	7.22	19.30
Diarrhea and gastro-enteritis	4.96	24.26
Acute appendicitis with peritoneal abscess	3.93	28,19
Gastroduodenitis	2.82	31,01
Gastroenteritis and non-infectious colitis	2.75	33.76
Dyspepsia	2.50	36.26
Acute appendicitis with generalized peritonitis	2.50	38.77
Acute duodenal ulcer without hemorrhage or perforation	2.28	41.04
Acute duodenal ulcer with hemorrhage	2.25	43.30

### Analysis by organizational criteria

Distribution by areas shows increased frequency in the southern and eastern region of the country (Figure 1).

The highest values were registered in Bucharest and Cluj.

One of 5 patients with digestive diseases is hospitalized in Bucharest but only one of 10 patients lives in Bucharest (Table 4).

The great majority of patients (98%) have health insurance provided by CNAS (National Health Insurance Company).



Figure 1. Area distribution of hospitalized patients with digestive diseases

Pacient county	Total [%]
Bucharest	18.35
Cluj	5.48
Iasi	4.40
Prahova	3.31
Galati	3.31
Dolj	2.99
Timis	2.88
Bacau	2.76
Mures	2.67
Constanta	2.55

Table 4. Hospitalized cases frequency by counties

Hospital county	Total [%]
Bucharest	10.20
Prahova	3.80
Cluj	3.57
Galati	3.25
Bacau	3.02
Iasi	2.87
Dambovita	2.86
Arges	2.85
Dolj	2.76
Buzau	2.76

#### Hospitals

To some hospitals, digestive diseases and disorders represent an increased part in the morbidity structure (in four hospitals digestive diseases totalize over one quarter of cases). Further down, there is a presentation of hospitals with higher percentage of digestive disorders. There is an increased rate of cases in the Gastroenterology and Hepatology Institute in Iasi, witch is a specialized unit (31.64%) (table 5). Also, there is a high rate of hospitalization in infectious disease units, like in the pas years [5,6].

Nama of hospital		Digestive	%
Ivanie of nospital	cases	cases	Total
Institute of Gastroenterology and Hepatology Iasi	2408	762	31.64
Infectious disease hospital Ploiesti	873	251	28.75
Emergency hospital for children "Grigore Alexandrescu"	10186	2572	25.25
Iasi	10180	2372	23.23
C.F.R. Hospital Galati	2051	497	24.23
Infectious disease hospital Oradea	1632	339	20.77
Infectious disease hospital Constanta	2083	388	18.63
Cluj-Napoca hospital	10615	1956	18.43
RATB health centre	866	158	18.24
Research and medical assistance centre Simleu Silvanei	963	174	18.07
Braila county emergency hospital	17218	3108	18.05

### Table 5. Hospitals with high percentage of digestive disease cases

#### Analysis by demographic criteria

Many of the patients are young (almost one third are under 20 and almost a quarter

under 14) and there is a male predominance (Table 6 and Figure 2).

Table 6. Distribution of patients according to age and gender				
Age group	F	Μ	Total	
[years]	[%]	[%]	[%]	
0-14	24.22	20.64	22.38	
15-19	10.99	5.83	8.34	
20-24	3.70	4.72	4.22	
25-29	3.92	4.62	4.28	
30-34	3.75	4.79	4.28	
35-39	4.61	4.83	4.72	
40-44	3.75	4.25	4.01	
45-49	5.82	6.13	5.98	
50-54	7.07	7.56	7.32	
55-59	6.38	7.72	7.07	
60-64	6.36	7.51	6.95	
65-69	7.41	8.48	7.96	
70-74	5.53	6.38	5.97	
Over 75	6.48	6.54	6.51	



Figure 2. Percentage of hospitalized cases according to age group and gender

There is a higher predominance in males, compared to women regarding digestive diseases (10% to 7%), similar to other disorders from the same category, with

frequent hospitalizations (Table 7). These data are similar to other ones, gathered by different studies [1,6,7,13].

Major diagnosis criteria	F [%]	M [%]	Total [%]
Respiratory system diseases and disorders	9.03	15.42	11.81
Circulatory system diseases and disorders	9.68	11.68	10.55
Digestive system diseases and disorders	7.27	9.97	8.43
Pregnancy, birth	14.38	0.00	8.12
Musculoskeletal system and connective tissue diseases and disorders	7.66	8.47	8.01

### Table 7. Percentage distribution of patients, divided by gender

Analysis by hospitalization period More than half of the patients had a hospitalization period between 2 and 6 days (Figure 5); the typical hospitalization period is 7 days (12% of cases).

## Analysis by hospitalization/discharge types

Half of the cases were emergency hospitalizations

(Table8).



Figure 3. Distribution of digestive cases according to hospitalization period

Type of insurance	Type of hospitalization	Total
	Emergency	47.95
	Sent by the family doctor	25.65
National Health	Sent by the specialist	22.54
Insurance	Other	1.51
	Transfer between hospital	0.30
	On demand	0.01
Total:		97.95
Without insurance	Emergency	2.05
Total:		2.05

### Table 8. Frequency of cases by hospitalization type

The most frequent diagnosis for emergency hospitalizations was the acute appendicitis with 15.04% (Table 9).

Main diagnosis for emergency cases				
Acute appendicitis	15.04			
Acute appendicitis with peritoneal abscess	5.67			
Diarrhea and possibly infectious gastroenteritis	5.31			
Unilateral groin hernia, without occlusion or gangrene	4.25			
Acute appendicitis with generalized peritonitis	3.70			
Gastroenteritis and non-infectious colitis	3.30			

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### **Discharge type and status**

The majority of patients (93%) are healed or improving when discharged. Mortality is lower than 1%.

Three out of four patients transferred to another hospital have a more severe status upon discharge (Table 10).

Discharge type	Discharge status	Total [%]		
Discharged	Healed	47.15		
	Improved	44.01		
	Standing	4.54		
	Aggravated	0.13		
Total:	95.84			
Discharged on demand	Healed	0.43		
	Improved	1.52		
	Standing	0.33		
	Aggravated	0.15		
Total:	2.43			
Interhospital transfer	Healed	0.04		
	Improved	0.18		
	Standing	0.39		
	Aggravated	0.27		
Total:	0.88			
Deceased	Deceased	0.85		
Total:				

Table 10. Distribution of cases according to discharge type and status

### **DISCUSSIONS**

- ▶ Nationwide, hospitalizations within this diagnosis category occupy third place as number of cases (8% out of total hospitalized cases)
- Almost half of the cases belong to 3 diagnosis groups (esophagitis, gastroenteritis, appendectomy)
- Majority of cases are non-surgical
- ≻ For some hospitals, digestive diseases and disorders represent an increased part in the morbidity structure (in four hospitals digestive

diseases totalize over one quarter of cases)

- A lot of patients are young (one third are under 20 years old)
- The majority of patients (93%) are healed or improving when discharged, mortality being lower than 1%.
- Implementing hospital management is important for the following reasons:
  - For a more efficient administration of the health system as a total and mainly the hospitals, to undo the bureaucracy of the system and to increase the obligations and competence of hospital managers
  - To improve the hospital services efficiency and quality by improving the quality indices
  - To diminish the financial losses
  - To shape the hospital activity to specific demands.

It is difficult to evaluate the trend in the last years, because of changes in data management and indicators but for all cases of digestive disorders hospitalized in the last two years compared to 2007, it shows a higher frequency of cases on the same department and hospitals, the mortality remains the same, also the hospitalization period and young age of definition are the same like in other national studies [6,11,12].

The elementary health care is based on practical methods and technology, scientifically tested and socially accepted, meant to be universally accessible to individuals and families from the community, and at a cost that the community and the country can afford to maintain each stage of development.

This is an integral part of the country's health system, being a central and main

function as well as problem, being a part of the world's social and economic development. It represents the first level of contact between individuals, families and community with the national health system, trying to bring closer as much as possible the activity from the health department with the natural and working environment, being the first element of an ongoing process.

### CONCLUSIONS

Compared to the surrounding countries, Romania spends less for the population's health, therefore there are ongoing problems regarding child mortality, maternal mortality, the prevalence of curable diseases such as tuberculosis. There is a wide variation in results connected to health in countries with similar levels of income and education. Some variations are due to health systems' performance differences.

According to WHO, the concept of performance is based on 3 fundamental aspects:

- ✓ health improvement
- ✓ increasing the capacity of responsiveness to the population's expectations
- ✓ ensuring equity concerning financial contribution

An improvement is required in the responsibility and transparence of allocation and usage of health system resources by implementing a computational system to monitor hospital morbidity and a financing system based on resolved cases (DRGs) in hospitals and the evaluation of these actions.

Hospital data management facilitates the access to structural European funds, such as integration in the European information management networks and models.

### REFERENCES

- 1. \*\*\*, Report of Digestive Health Initiative International Update Conference on Helicobacter pylori", Gastroenterology, 2003, 113: 54-58
- 2. \*\*\*, National Institutes of Health (NIH) consensus Conference, "Helicobacter pylori in peptic ulcer disease", JAMA, 2004, 272: 65-69
- McKee M., Healy J., 2002, Hospitals in a changing Europe, European Observatory on Healthcare Systems, series Open University Press, OMS
- 4. Vlădescu C., Rădulescu S., Olsavszky V., 2008, Sisteme de sănătate în tranzitie. România, 2007. Observatorul European al sistemelor de Sănătate, Organizatia Mondială а Sănătății - Biroul Regional pentru Europa
- 5. Hornby P., Forte P., 2002, Guidelines for introducing Human Resources Indicators to monitor health services performance, Centre for health planning and management, Keele University

- Popescu I., Câmpeanu I., 2009, Surgical anatomy of the liver and liver resection. Brisbane 2000 Terminology, Chirurgia, 104(1):7-10
- 7. \*\*\*, Legea nr. 95 din 14 aprilie 2006 privind reforma în domeniul sănătății, publicată în MO nr.372 din 28.04.2006, Titlul VII Spitalele
- 8. \*\*\* WHO "The World Health Report 2007, Health systems: Improving Performance", 2008
- 9. \*\*\*, www.drg.ro
- \*\*\*, Institutul Național de Statistică, 2008, Anuarul Național de Statistică al României – 2007, Bucharest
- Bara A.C., van den Heuvel W., Maarse J.A., 2002, Reforms of the Health Care system in Romania, Croatian Medical Journal, (43): 446-252
- Necula A., Vlad L., Iancu C., Munteanu D., Puia C., Bălă O., AlHajaar N. et al., 2008, Morbidity and mortality in gastric cancer surgery-analysis of 468 cases with gastric adenocarcinoma, Chirurgia, 103(5):529-37.

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### ETIOLOGYCAL AND FAVORING FACTORS INVOLVED IN NOSOCOMIAL INFECTIONS

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### REZUMAT

Infecțiile nosocomiale sunt considerate o problemă majoră de sănătate publică în toate unitățile spitalicești. Ele se caracterizează printr-un spectru larg etiologic, agenții fiind bacterii patogene, condiționat patogene, virusuri și chiar paraziți, iar sursa acestor agenți etiologici poate fi endogenă sau exogenă. În spitale, antibioticoterapia determină selectarea unei flore rezistente, rezultând un dezechilibru între flora autohtonă și cea supraadăugată. Factorii cei mai importanți ai vulnerabilității la infecțiile nosocomiale sunt vârsta, statusul imunitar, unele infecții subacute, intervențiile invazive terapeutice și de diagnostic.

Cuvinte cheie: infecții nosocomiale, agenți etiologici, populație microbiană

### ABSTRACT

Nosocomial infections are considered to be one of the major problems of public health in all hospital services. They are characterized by a large etiological spectrum. Etiological agents of nosocomial infection can be pathogenic bacteria, conditionally pathogenic bacteria, viruses or even parasites. The origin of the etiological agents can be endogenous when the source is the patient, or exogenous. In hospitals the antibiotics exercise a selective pressure on microorganisms, achieving a selection of poor microorganisms, resulting an imbalance between the permanent autochthonous microbial population and the microbial floating population, represented by non-adapted or less adapted species. Important factors of vulnerability which influence the possibility of contacting a nosocomial infection are the age, the immunity state, any sub acute illness and interventions in therapeutic or diagnostic purpose.

Keywords: nosocomial infections, etiological agents, microbial population

### **INTRODUCTION**

Nosocomial infections are considered one of the major problems of public health for all hospital services. They occur because of changes in the human ecosystem, through abuse of antibiotics, the false protection offered by them, the increased prevalence of compromise hosts, waiver to severe application of the rules of hygiene, with the antibiotics therapy successes, disruption of relationships between different categories of pathogens and decreased resistance to general categories of under privileged populations [1]. Nosocomial infection is the infection contracted in medical-sanitary or medicalsocial units and relate to any disease due to microorganisms clinical recognized or by laboratory tests that are affecting the patient due to his stay in the hospital and the received treatment, either the hospitalized patient or in ambulatory treatment either because of health staff in hospital units, the ambulatory or medical-social assistance units [2].

To prove that an infection is nosocomial, there shall be no evidence that the infection was present or in incubation period, when the patient was interned in the hospital. Nosocomial infection is the infection acquired in the hospital but diagnosed after leaving the hospital.

It is not considered a nosocomial infection, an infection associated with a complication or extension of an infection present on admission, if it is not changed the pathogen agent or show no signs of a new infection [3].

Nosocomial infections worsen existing dysfunction and emotional tension of the patient and in some cases can lead to distortions that reduce the quality of life.

Due to the epidemiological and clinical polymorphism, the prevention and treatment of nosocomial infection have difficulties.

Values of indicators of morbidity and lethal worldwide have an estimate character, because the incidence and prevalence of nosocomial infections are undervalued [4].

### FACTORS INVOLVED IN THE ETIOLOGY OF NOSOCOMIAL INFECTIONS

Nosocomial infections are characterized by a broad etiological spectrum. Some of the microorganisms incriminated are recognized as pathogens and other species are saprophytic and develop infectious processes only under certain conditions. The origin of the etiology agents may be both endogenous, the source being the patient itself, and exogenous [5].

Most commonly blamed bacterial agents in the etiology of nosocomial infections are: staphylococcus aureus, followed by gram negative organisms: E. coli, Klebsiella, Ps.aeruginosa, Proteus. Enterobacter. Acinetobacter, Serratia. Less frequently encountered species are: enterococcus,  $\beta$ haemolytic streptococcus, Shigella, Salmonella, My.tuberculosis, My.chelorii, anaerobic, hull, anaerobic gram-positive and gram-negative bacillus. Between pathogenic conditional bacteria can be included: Citrobacter. Moraxella, Campylobacter, Staphylococcus Yersinia enterocolitica, epidermidis. Streptococcus, sanguis. salivarus, Pasteurella. Genus Candida, especially Candida albicans cause iatrogenic infections due to disruption in the normal microbial flora, under the action of antibiotics and the decreased resistance of the organism [6].

All viruses can cause nosocomial infections, with higher prevalence the hepatitis viruses A, B, C, D, E, H, HIV, measles virus, rubella, herpes viruses, influenza and parainfluenza viruses, corona virus, respiratory syncytial virus, adenoviruses, enteroviruses, rotaviruses and only in certain circumstances hemorrhagic fever prion virus.

It may signal nosocomial infections of parasitic origin: Plasmodium, Pneumocystis carinii, Toxoplasma gondii.

These microorganisms have a wide spread in the hospital, checking the aggressive strains resistant to multiple antibiotics.

In hospitals, antibiotics exert selective pressure on microorganisms, producing conditions for the selection of deficient

microorganisms, because of many investigations or long-term treatment, leading to imbalances between autochthon population. persistent microbial and microbial floating population, represented by temporary non-adapted species or slightly adapted [7].

In nosocomial cross-infection, the transfer of resistant strains is bi and multidirectional, seen in some services (combusted sections, newborns, renal dialysis, intensive care), between different services or between medical services and population health.

Bacterial resistance may be natural, of species, or gender, or gained by the emergence of mutations of existing genes or new gained genes, which are generally transmitted from one cell to another through mobile genetic elements such as plasmids, transposomes and phages, modified plasmids, the emergence of strains with resistance R factor (resistance plasmid), strains with the cloning of chromosomal changes (chromosomal resistance) and the emergence of R plasmids which generates resistance and transfer factor R into interspecies [8].

Biochemical mechanisms of bacterial resistance are:

- The production of inactivating enzymes ( $\beta$  lactamases, mediated-plasmid enzymes, Onuceotidasis, O - phosphorilasis, O acetylase and acetilphosphorilase);

- Alteration of the intracellular target by modifying the ribosomal proteins, creating an excess of molecular targets;

- Modification or blocking of metabolic reactions;

- Excessive development or production of modified enzymes (polymerases, transpeptidases, carboxypeptidases);

- Decreased bacterial permeability to antibiotics through alterations of cell wall or cytoplasm membrane; - Increased synthesis of paraaminobenzoic acid which cancels the competitive inhibition of sulfamides.

Using a treatment with generalized prophylactic antibiotics is a primary determinant of resistance. Using a long antimicrobial product, lead to resistance to the product and bacteria may be spread in the hospital.

Bacterial resistance may be simple (single antibiotic), multiple (more antibiotics), crossed (bacteria with similar structure and antibiotics with similar molecular target), transferable (bacteria with similar or different molecular target).

Resistance bacteria present in normal flora have a protective role to prevent pathogenic micro-organisms colonization. Some resistance bacteria can cause infections if natural resistance is compromised (ex intestinal E. coli is the most common cause of urinary tract infections).

Potentially pathogenic bacteria are saprophytic bacteria widely spread. When changes occur in the host and in the microbial agent these bacteria change their behavior towards the host. Potentially pathogenic bacteria are divided into three categories:

- In the first group are included genetically weak pathogens, which become aggressive because of the weak field. Variations of these pathogenic bacteria are due to genetic changes without affecting the species ( $\beta$ hemolytic streptococcus, Ps.aeruginosa, Proteus, E. coli, Klebsiella pneumoniae);

\_ Second group contains potentially pathogenic bacterial species that produce potentially pathogenic clones and can be highlighted through the study of the produced clones, serological typization, phage typization, plasmides profile (ß hemolytic streptococcus group A, Salmonella typhi, Yersinia V. pestis, holerae, Staphylococcus aureus);

- The third group is: Streptococcus viridans, mitis, sanguis, salivarium, Citrobacter, Campylobacter, Y.enterocolitica, Staphylococcus epidermidis, pathogenic, nonpathogenic or accidentally pathogenic bacteria.

Potentially pathogenic bacteria are floating bacterial agents or temporary resistant, with a large dissemination (the tegument, the oral mucosa, upper respiratory pathways, stomach, duodenum, jejune, colon, vagina, urethra, etc..) and a variable persistence and that can be easily removed by preventive methods and can cause an infection when an imbalance appears due to decreased of natural protection and potential growth of these pathogenic bacteria [9].

Factors involved in foster nosocomial infections.

The patient is exposed during hospitalization to a large variability of microbial agents. Contact between the microorganism and the patient does not necessarily produce a clinical disease, given that other factors may influence the nature and frequency of nosocomial infections namely: micro-organism characteristics, his resistance to antibiotics, virulence and quantity of infectious material [10].

Important factors of vulnerability of the patient that influence the possibility of contacting a nosocomial infection are: age, immunity status, and any sub-acute disease, therapeutic interventions and diagnostic. Patients with chronic diseases, malignant tumors, leukemia, diabetes, renal failure or AIDS, have a high vulnerability to infections by opportunistic pathogens [11].

The favoring factors of epidemic infection with pathogenic bacteria conditioning are multiple:

- Construction and inadequate operation of medical units, circuit failure, lack of water, failure of hygiene measures and disinfection of patients, instruments, pajamas and bed clothes, overcrowded spaces, lengthy hospitalizations, insufficient staff and inadequate training, insufficient epidemiological and laboratory surveillance to medical and health services,

- Environmental contamination with pathological products during invasive interventions,

- Existence of optimal conditions for survival and dissemination of pathogens,

- Medical and surgical interventions elusive for diagnostic or therapeutic (catetherism, bronchoscopy, traheostomy, citoscopy, laparoscopic interventions on the heart or lungs)

-Corticoids therapy, chemotherapy, immune depression therapy,

- Abuse of antibiotics,

- Malnutrition,

- Age (premature, newborns, infants, and elderly with chronic and exhausting diseases) **64** 

#### REFERENCES

- 1. \*\*\*, 2004, Ordinul 994 emis de Ministerul Sănătății
- 2. Ivan A., 2002, Tratat de epidemiologie a bolilor transmisibile, Editura Polirom Iași, 732-752
- 3. Carlet J., 1995, Infections nosocomiales, Communication Partenaires Sante
- 4. Deac L., 1997, Infecțiile nosocomiale, Editura Dacia Cluj Napoca
- 5. Naoumov N.V., Petrova E.P., Thomas M.G., 1998, Presence of a new bydescribed human DNA virus (TTV) in patients with liver disease, Lancet, 352, 195-197
- Duca E., 1981, Factori de risc în infecția nosocomială, Rev.Med.Chir. Iași, 1, 188-200

- 7. Vlaicu B., 1996, Sănătatea mediului ambiant, Editura Brumar Timișoara, 116-119
- 8. Gastmeier P., 2001, Nosocomial urinary tract infections: many unresolved questions, Clin. Microbiol. Infect. Dis., 7, 521-522
- 9. Harrison, 2003, Principles of Internal Medicine, Editura Teora, București, 932-939
- Ivan A., Azoicăi D., 1996, Infecțiile nosocomiale, Epidemiologia generală și specifică, Editura Polirom Iași, 93-96
- Angelescu M., 1998, Practica antibioticoterapiei. Indicații terapeutice și profilactice, Terapia cu antibiotice, Editura Medicală București, 192-204

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### THE CONSUMPTION OF TOXIC SUBSTANCES IN PUPILS FROM VOCATIONAL SCHOOL IN THE REPUBLIC OF MOLDOVA

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### REZUMAT

În 2/3 din țările ESPAD, marea majoritate a elevilor, cu vârsta cuprinsă între 15-16 ani, 90% sau mai mult, au consumat alcool cel putin o dată în viață. Consumul regulat de alcool este mai puțin frecvent decât prevalența consumului de alcool pe viața. În studiul efectuat am aplicat un chestionar specific pentru consumul de alcool, unui esantion de 771 elevi (344 fete și 427 băieți), ce studiază în 2 școli din Chișinău și 12 școli în mediul rural. Berea a fost declarată ca alcoolul preferat de elevi (44,9% baieți, fete 37,2%) și, au consumat alcool în special cu prietenii (60,7% baieți, fete 52,8%), în locuri publice (baieți 46,5%) și la domiciliu (55,4% fete), putând cumpăra alcool fără a face dovada vârstei (75% baieți, fete 87,8%). 1 / 3 din fete și 2 / 3 din băieți uneori, au fost în stare de ebrietate. Un număr semnificativ de elevi, în special baieți, afirmă că au călătorit într-o mașină condusă de cineva beat sau aflat sub influența alcoolului. Frecvența fumatul a fost investigată în Europa, prin studiul ESPAD și a fost identificată o frecvență a fumătorilor de 30% din tineri cu vârsta cuprinsă între 15-19 ani. În Europa de Est 29% din tineri cu vârsta cuprinsă între 15-16 ani sunt fumători, în comparație cu 26% în Europa de Vest. În studiul efectuat am investigat grupul de fumători din care se remarcă elevii fumători din școlile profesionale din Republica Moldova. Metoda a constat într-un chestionar specific aplicat unui eșantion de 771 elevi educati în 14 scoli profesionale (2 din Chisinău si 12 din mediul rural), cu o perioadă de instruire de 3 ani. Elevii fumători, de obicei, au fumat împreună cu prietenii și colegii, pe stradă, în parcuri, discoteci, baruri, restaurante. Își procură țigările singuri sau de la colegi și le pot cumpăra cu ușurință, fărăa fi întrebați de vârstă. În concluzie, grupul de fumat este o realitate cu puternică influență asupra elevilor fumători.

Cuvinte cheie: consumul de alcool, grupul de fumat, elevi, şcoală profesională

### ABSTRACT

In the 2/3 of the ESPAD countries, the main majority of pupils with age between 15-16 years (90% or more) consumed alcohol at least once in their life. The regular consumption of alcohol is less frequent than the prevalence of life alcohol consumption. In the performed

study we applied a specific questionnaire for alcohol consumption on a sample consisting of 771 pupils (344 girls and 427 boys) educated in 2 schools from Chisinau and 12 school in rural areas. Beer was registered as the preferred alcohol for pupils (44.9% boys, 37.2% girls) and they consumed alcohol especially with friends (60.7% boys, 52.8% girls), in public places (46.5% boys) and at home (55.4% girls), and they can buy alcohol without making the proof of age (75% boys, 87.8% girls). 1/3 of the girls and 2/3 of the boys became sometimes drunk. A significant number of pupils, especially boys, affirm that they traveled in a car driven by someone drunk or under the influence of alcohol. The smoking frequency was investigated in Europe through the ESPAD study and a smoking frequency of 30% of the young people, with the age between 15-19 years, was identified. In Eastern Europe 29% young people with ages between 15-16 years are smokers in comparison with 26% in Western Europe. In the performed study we investigated the smoking group from which are part the smoking pupils of vocational schools from the Republic of Moldova. The method consisted in a specific questionnaire applied in a sample of 771 pupils educated in 14 vocational schools (2 from Chisinau and 12 from rural areas) with a 3 years period of study. The smoking pupils smoke usually with friends and colleagues, on the street, in parks, disco, bars, restaurants. They provide themselves with cigarettes or they receive them from the peers and they can buy easily the cigarettes without age questioning. In conclusion, the smoking group is a reality with powerful influence on smoking pupils.

Keywords: alcohol consumption, smoking group, pupils, vocational school

### **INTRODUCTION**

WHO estimates the existence of about 2 milliards alcohol consumers, approximately 76 millions being difficult to diagnose. the appearance of chronically Before diseases, which are possible to affect the drinkers after many years of excessive consumption, the alcohol contribute to generating traumatisms, which kill or disable persons relatively young, and result in damaging numerous years of live. Alcohol causes 1.8 millions deceases in a year (3.2% of total deceases). In Europe the consumption of alcohol is responsible for more than 55000 deceases of persons with age between 15-29 years in 1999 [1].

In 2/3 of the ESPAD countries a big majority of pupils with the age 15-16 years, 90% or more declared the consumption of alcohol at least once in their life. However, remember that not all the students had regular alcohol consumption, defined as 40 repetitions over lifetime. Prevalence rates of this latter type of consumption are much lower than the prevalence over lifetime [2]. The number of students consuming alcohol is 1540, which represents 54.1% of the total number of respondents in the study [3].

Smoking is an important risk factor for the health of young people worldwide [4]. This risk factor has immediate impact, especially on long-term state of health. One important effect is the phenomenon of installation of dependency, which then determinates the overlapping long-term disorders. Although numerous respiratory illnesses are listed (bronchopulmonary cancer, bronchitis, chronic obstructive bronchoasthma. pneumonia), smoking among causal factors also the cause of cardio-vascular, is digestive and skin diseases. Last but not least. cigarette smoke shortens life expectancy, especially in people who are around smokers [5-9]. The frequency of smoking in young people has been investigated in Europe by a study which included several European countries (ESPAD). Approximately 30% of young people aged 15-19 years in Europe are smokers. Since 1990 the number of smokers in Eastern Europe began to slightly increase compared with those in Western Europe, where the number of smokers remained stable. Although the number of adult smokers tends to decline in many countries in Europe, the number of young smokers has tended to increase. In Eastern Europe 29%

smoking young aged 15-16 years compared 26% in Western Europe. with The difference between the two parts of Europe on the frequency of smoking is much higher in adults: 34% in Eastern Europe, 24% in Western Europe. The difference between the two sexes in terms of smoking is low at 15-16 years (29% boys and 25% girls) and high in adults (35% men and 22% women). The increased frequency of smoking at the age of 15 years was found in Germany, Czech Republic (33%), Austria (32%), and Finland (30%). Low levels of smoking frequency were found in Malta (17%), Sweden (15%) and Greece (14%) [10].

#### MATERIAL AND METHODS

It was used the questionnaire method, studying the consumption of alcohol at students from professional schools in Moldova. The studies were made on a sample of 771 pupils (girls -344, boys -427), students of 14 vocational schools (3 years training period), in Chisinau -2 institutions and in rural areas -12.

#### **RESULTS AND DISCUSSIONS**

According to the questioning of professional school students, the preferred alcoholic drink, for both boys and girls, is beer. Of the total number of responses beer was nominated by the boys in 44.9% cases, and the girls in 37.2% cases. On second place is the wine (boys nominated wine in 25.6% of the total number of answers, the girls -31.1%). followed by preference for champagne, which is more popular among girls (26.1%) compared with boys (16.2%). In these countries the number of boys that consume alcoholic beverages (vodka, cognac, brandy etc.) is twice as high (13.3%) compared to girls (5.6%).

Of the total number of students interviewed, 22.4% boys and 39.2% girls admit to consuming alcohol. Entourage who consume alcoholic beverages is different (Figure 1).



# Figure 1. Pupils answer at the question: "With whom consumes the alcohol?" (%)

Both boys (60.7%) and girls (52.8%) most frequently consumed alcohol with friends, and secondly the boys placed colleagues (25.6%) and girls – family (31.0%).

They prefer to consume alcoholic beverages in public places – disco, bars, restaurants (46.5%) and fewer at home or at someone else's home (31.1%). Most girls consumed alcohol at home and/or at someone else's home (55.4%) and less in public places

(30.7%) (Figure 2).



Figure 2. The places where the pupils consume alcohol (%)

In the boys group undergoing questioning, the share of those who purchased the alcohol is higher compared to the girls (for the first year is 57.0%) and shows a sudden increase the second year (79.3%), while is almost at the same level in the third year (80.6%). The share of girls who have bought alcohol has tended to increase slowly from the firstly (37.6%) for the third year (46.7%). For purchase of alcoholic beverages it was required proof of age to 25.0% boys and 12.2% girls (of those who purchased the alcohol).

To obtain alcohol boys usually buy it (60.2%). Girls highlighted a few possibilities: someone else buys alcohol (27.7%), to buy for themselves (23.7%), to get (23.6%) or other (25.0%).

34.3% girls and 66.6% boys admitted to have drunk at least once. Most girls have recognized to abuse consumption of alcohol, and were intoxicated 1-5 times, boys from 1-2 times to a dozens of times.

In the first year 49.7% of boys said they were drunk at least once, and then the next year their number increased sharply (76.6%), while in the third year was at the same level (75.4%). The shares of girls who have gone through this experience show a slower increase (from 31.3% in the first year to 39.6% in the third year). Among boys it has increased the frequency of consumption of alcohol: if in the first year 5.4% boys admit to have been drunk many times, then in the third year their percent rose to 27.7% (Table 1).



n om vocational school in Acpublic of Moldova (70)										
	I school	I school year		II school year		III school year				
Frequency	girls	boys	girls	boys	girls	boys	i otur			
	%	%	%	%	%	%	%			
Never	68.7	50.3	67.8	23.4	60.4	24.6	47.8			
1 – 2	17.4	29.5	20.0	35.8	24.3	19.4	24.8			
3 – 5	9.5	12.8	7.8	13.1	9.0	16.4	11.7			
6 – 9	0.9	2.0	2.6	10.9	4.5	11.9	5.7			
10 – 19	2.6	3.4	0.9	5.8	-	7.5	3.5			
20 – 39	0.9	1.3	-	1.5	0.9	4.5	1.6			
40 - over	-	0.7	0.9	9.5	0.9	15.7	4.9			
Total	100	100	100	100	100	100	100			

Table 1. The abusive consumption of alcohol (to be intoxicated) in the middle pupilsfrom vocational school in Republic of Moldova (%)

Risky behavior, namely, to drive a vehicle after consuming alcohol in the last 30 days preceding the questioning, is recognized by 15.2% boys and 3.2% girls, as a rule of 1-3 times. Among boys this risky behavior meets 2 times more frequently in the II-III compared with the first year.

Children admit a certain tolerance for professional people who consume alcohol, 20.8% of them were in a car driven by a person who has consumed alcoholic beverages. This is more frequently among boys (25.0%) compared to girls (15.7%) and has tended to increase in boys from the first year to the III year.

How to buy cigarettes by the professional school students is different (Figure 3). They mainly buy their own cigarettes (79.8%), as well as a large proportion of girls (44.9%). A large mean to obtain cigarettes by the girls is that they get them from other people (36.7%).



Figure 3. The mode to receive the cigarettes in pupils of vocational schools (%)

Proof of age is necessary for purchasing cigarettes as it shows the legislation in force, which prohibits the marketing of cigarettes to minors. The questioning of vocational schools students shows that 40.8% of them have purchased cigarettes, but most of them were not required to prove what age they have. From 57.1% to 62.8% boys and from 59.3% to 87.0% girls were required to prove the age when they purchase cigarettes.

Smoking entourage of the students in vocational schools consists mainly of friends and/or colleagues (Figure 4). Most of the girls (58.5%) and boys (50.3%) prefer to smoke with friends. Students smoke quite frequently with peers (girls – 20.7%, boys – 28.8%). Simultaneously some pupils prefer smoking alone (girls – 18.9%, boys – 19.9%).



Figure 4. Pupils answers at the question: "With who do you smoke?" (%)

The students choose to smoke on the street, parks and/or discos, bars, restaurants. Girls smoke most often in the street, parks (34.5%), then follow discos, bars and restaurants. Some girls smoke at home, at someone else's home and/or at school (Figure 5). Boys declared discotheques,

bars and restaurants as places where they smoke (27.7% response), then follows the street and parks. Compared with girls, boys smoke at school twice as often (15.1% response) and 1.5 times at home and/or someone else's home.



Figure 5. The places were the pupils smoke (%)

### CONCLUSIONS

- Beer is the favorite alcoholic drink to pupils in vocational schools;

- Most frequently students drink alcohol with friends;

- Boys prefer to consume alcoholic beverages in public places, girls – at home or at someone else's home;

- For the purchase of alcoholic beverages in most cases, adolescents are not required proof of age;

- 1/3 girls and 2/3 boys have been drunk at least once;

- Risky behavior, as it is to be in a car driven by someone who has consumed alcohol or to drive a vehicle after having consumed alcohol, it is recognized by a large number of boys;

- Most common way to get cigarettes is for boys to buy them alone, for girls – single and/or receive them from others;

- Proof of age to purchase cigarettes in most cases is not required by the operators;

- Students mainly smoke with friends and/or colleagues;

- Pupils from the vocational schools, as a rule, smoke in the street, parks and / or discos, bars, restaurants.

### REFERENCES

- 1. \*\*\*, 2004, Global Status Report on Alcohol, WHO www.who.int/substance\_abuse /publications/alcohol/en/
- Hibell B., Anderson B., Bjarnason T., Ahlström S., Balakireva O., Kokkevi A., Morgan M., 2003, The ESPAD Report 2003. Alcohol and Other Drug Use Among Students in 35 European Countries
- Vlaicu B., 2007, Comportamente cu risc la adolescenții din județul Timiş, Editura Eurobit, Timişoara, 67
- Neovius M., Sundström J., Rasmussen F., 2009, Combined effects of overweight and smoking in late adolescence on subsequent mortality: nationwide cohort study. BMJ, 338:b496
- 5. O'Dowd A., 2005, Smoking ban in public places also cuts smoking at home. BMJ, 331:129
- 6. Rubin MT., Jeong HY., 2008, It takes two to tango: cigarette smoke partners with viruses to

promote emphysema. J. Clin. Invest. 118(8): 2689-2693

- Hublet A., De Bacquer D., Boyce W., Godeau E., Schmid H., Vereecken C., De Baets F., Maes L., 2007, Smoking in young people with asthma. Journal of Public Health: 10.1093/pubmed/fdm047.
- Cesaroni G., Forastiere F., Agabiti N., Valente P., Zuccaro P., Perucci CA., 2008, Effect of the Italian Smoking Ban on Population Rates of Acute Coronary Events Circulation. 10.1161/CIRCULATIONAH A.107. 729889
- Bosetti C., Franceschi S., Levi F., Negri E., Talamini R., La Vecchia C., 2000, Smoking and drinking cessation and the risk of esophageal cancer. British Journal of Cancer, 83, 689-691
- 10. \*\*\*, 2004, Statistics on youth smoking in different countries. National Institute for Health and Welfare, Helsinki, Finland, http://www.ktl.

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### ULTRASOUND ASSESSMENT OF LIVER VASCULARISATION IN HEPATIC CIRRHOSIS

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### REZUMAT

Ciroza hepatică este caracterizată de modificări morfologice și funcționale. Anomaliile vasculare sunt reprezentate de hipertensiunea portală și modificările circulației arteriale hepatice. Toate acestea pot fi studiate utilizând ultrasonografia abdominală asociată cu explorarea Doppler a vaselor hepatice (venă portă, arteră hepatică). Obiectiv: Obiectivul studiului este reprezentat de cercetarea vascularizației hepatice la pacienții cu ciroză hepatică, utilizând ultrasonografia abdominală asociată cu explorarea Doppler a vaselor hepatice. Material și metodă: Studiul a fost efectuat pe un grup de 25 pacienți cu ciroză hepatică de etiologie virală și alcoolică. Studiul circulației intrahepatice (venă portă, arteră hepatică) a fost efectuat utilizând ultrasonografia abdominală asociată cu explorarea Doppler vasculară. Varicele esofagiene au fost evidențiate prin intermediul endoscopiei digestive superioare. Rezultate: Grupul a fost format din 14 bărbați și 11 femei. Etiologia cirozei hepatice a fost reprezentată de: virusul hepatitic B (7 pacienți), virusul hepatitic C (6 pacienți), alcoolul (12 pacienți). Conform clasificării Child-Pugh, pacienții au fost încadrați astfel: 7 pacienți (clasa A), 8 pacienți (clasa B), 10 pacienți (clasa C). Viteza portală medie a fost normală la pacienții din clasele A și B, dar redusă la cei din clasa C (p < 0.01). Diametrul venei porte a fost crescut la toate cazurile. Debitul venos portal a fost crescut la bolnavii din clasele A și B, dar redus la cei din clasa C (p < 0,01), indicele de congestie fiind crecut la toate cazurile. Splenomegalia și creșterea diametrului venei splenice au fost întâlnite la toți pacienții. Debitul arterial hepatic a fost normal la ciroticii din clasele A și B, dar crescut la cei din clasa C (p < 0,01). Indicele de rezistență în artera hepatică a fost redus, normal sau crescut, iar circulația colaterală (varice esofagiene) a fost identificată în toate cazurile. Concluzii: În ciroza hepatică, modificările hemodinamice implică atât circulația portă, cât și cea arterială hepatică. Aceste modificări, studiate prin ultrasonografie, sunt dependente de gradul hipertensiunii portale, furnizând informații despre prognostic, ghidând astfel terapia.

*Cuvinte cheie*: hiperteniune portală, ciroză hepatică, ultrasonografie vasculară hepatică

### ABSTRACT

Hepatic cirrhosis is characterized by morphological and functional changes. Vascular changes are represented by portal hypertension and abnormalities in arterial liver circulation. All these changes may be assessed using abdominal ultrasonography combined with Doppler ultrasonography of hepatic vessels (portal vein, hepatic artery). Aim: The aim of this study is represented by the assessment of hepatic vascularisation in patients with liver cirrhosis, using ultrasonography. Material and method: The study was conducted on a group of 25 patients with viral or alcoholic hepatic cirrhosis. The grading of cirrhosis was realized using Child-Pugh classification. The assessment of hepatic circulation (portal and arterial) was performed using abdominal and Doppler ultrasonography. Esophageal varices were visualized during upper digestive endoscopy. Results: The group was formed by 14 males and 11 females. The etiology of hepatic cirrhosis was represented by: hepatitis B virus (7 patients), hepatitis C virus (6 patients) and alcohol (12 patients). Using Child-Pugh classification, the patients were classified: 7 patients (class A), 8 patients (class B), and 10 patients (class C). The mean portal velocity was normal in class A and B patients, but reduced in class C patients (p < 0.01). Portal vein diameter was increased in all cases. Portal flow was increased in class A and B patients and reduced in class C patients (p < 0.01), congestion index was increased in all cases. Splenomegaly and increased diameter of splenic vein were presented in all patients. Arterial hepatic flow was normal in class A and B patients, but increased in class C patients (p < 0.01). Index of resistance in hepatic artery was reduced, normal or increased and collateral circulation (esophageal varices) was identified in all cases. Conclusions: In hepatic cirrhosis, hemodynamic changes involve portal and hepatic arterial systems. These changes, assessed by abdominal and Doppler ultrasonography, depend on the degree of portal hypertension, giving information about the prognosis, guiding the treatment.

Key worlds: portal hypertension, cirrhosis, hepatic vascular ultrasonography.

### **INTRODUCTION**

Hepatic cirrhosis, end stage in inflammatory and degenerative chronic hepatic diseases, is defined by fibrosis and regenerative nodules, possibly associated with hepatocytes necrosis [1]. Etiology is various: viral infections (hepatitis  $B \pm D, C$ , G). intake. non-alcoholic alcohol steatohepatitis (metabolic syndrome), metabolic diseases (hemochromatosis, Wilson's disease. alpha1-antitrypsin deficiency, tyrosinosis, congenital galactosemia, glycogen storage disease), prolonged intra- or extrahepatic cholestasis, autoimmune hepatitis, vascular hepatic diseases, chronic drugs use (metothrexate, nutritional amiodarone), disorders (jejunoileal by-pass, malnutrition) or unknown (cryptogenic cirrhosis) [2].

Fibrosis and regenerative nodules distort normal liver architecture and lead to portal hypertension hypertension. Portal pathogenesis complex, due is to morphologic (sinusoid destruction. fenestration loss and sinusoid arterializations, distortion of vascular bed in portal spaces) and functional (increased cardiac output, vasodilatation, increased splanchnic blood flow, contractility of abnormal sinusoids) alterations [3-5].

Hemodynamic characteristics in portal hypertension are: increased portal resistance increased portal flow, portal-systemic shunts, splanchnic vasodilatation, decreased vascular systemic resistance, increased cardiac output, plasma volume and heart rate [6]. A noninvasive imaging method for portal hypertension display and quantification is abdominal ultrasonography combined with Doppler sonography of hepatic vessels [7].

The aim of this study is the ultrasonographic assessment of hepatic vascular bed (portal vein, hepatic artery) in patients with alcoholic and viral hepatic cirrhosis.

### **MATERIALS AND METHODS**

25 patients with alcoholic and viral hepatic cirrhosis were enrolled in this study and Child-Pugh classification was use for assessment of cirrhosis stage.

All patients underwent upper gastrointestinal endoscopy, for imaging and quantification of gastro-esophageal varices (Olympus endoscope).

Transabdominal ultrasonography was performed, using Aloka ProSound 4000 ultrasonograph, with 3.5 MHz convex transducer. The next parameters were assessed: mean portal flow velocity, portal vein diameter, spleen longitudinal diameter, spleen vein diameter, hepatic artery flow velocity. Using these parameters was calculated: portal flow, portal vein congestion index (CI), hepatic artery flow, hepatic artery resistance index (RI).

Vascular flow volume was calculated using the equation:

 $Q=\pi d^2 v/4$ ,

and congestion index using the formula:

CI=  $\pi d^2/4v$ , where d= vessel diameter and v =mean velocity.

Resistivity index (RI) was determined using the equation:

RI= (vmax-vmin)/vmax, [8].

The obtained data were expressed as mean value  $\pm$  standard deviation. Differences in mean values of these parameters between patients from different Child-Pugh classes were tested by Student's t-test. The level of statistical significance was set to p < 0.05.

### RESULTS

The group of 25 patients included in this study was formed by 14 males (56%) and 11 females (44%) (Figure1). Hepatitis B and C viruses and chronic alcoholism were the main causes of hepatic cirrhosis (Table1). Patients were divided in 3 study groups, according to the Child-Pugh classification (Table2). The haemodynamic characte-

ristics of the studied groups are presented in Table 3.

### DISCUSSIONS

Hepatic cirrhosis represents a diffuse liver disease, defined morphological by fibrosis, regenerative nodules, possibly associated with hepatocytes necrosis. The absence of hepatocytes necrosis and inflammatory infiltrate defines inactive hepatic cirrhosis [10]. Presence of fibrosis and regenerative nodules, obligatory criterions for the cirrhosis morphological diagnosis, leads to distort of normal architecture of the liver. The vascular impact of the abnormalities in liver structure is represented by the development of portal hypertension [11, 12].

The main causes of hepatic cirrhosis are hepatitis viral infections  $(B \pm D, C, G)$  and alcohol intake. Other etiological factors are: non-alcoholic steatohepatitis (metabolic syndrome). metabolic diseases (hemochromatosis, Wilson's disease. alpha1-antitrypsin deficiency, congenital tyrosinosis, galactosemia, glycogen storage disease), prolonged intra- or extrahepatic cholestasis, autoimmune hepatitis, vascular diseases, hepatic chronic drugs use (metothrexate, amiodarone), nutritional disorders (jejunoileal by-pass, malnutrition) or unknown (cryptogenic cirrhosis)[2].

Physiologically, hepatic blood flow is 1200-1500 ml/min, comprising portal flow (600-1200 ml/min) and hepatic artery flow (300-400 ml/min). The mean portal vein pressure is low, leading to a mean sinusoidal pressure of 5-10 mmHg. Hepatic artery flow is set up through intrinsic and extrinsic mechanisms. 76

One of the intrinsic mechanisms is miogenic, depending on the arterial pressure. Another intrinsic mechanism is represented by the hepatic arterial buffer response, which is responsible by the rising of arterial hepatic flow, secondary to decreased portal flow. Extrinsic setup is due to humoral factors and autonomic nervous system [13, 14]. Haemodynamic characterristics in portal hypertension are: increased portal resistance increased portal flow, portal-systemic shunts, splanchnic arterial vasodilatation, decreased vascular systemic resistance, increased cardiac output, plasma volume and heart rate [6].

Portal hypertension consequences are: collateral circulation development (with the risk of bleeding gastro-esophageal varices and portal encephalopathy), splenomegaly associated with dilated splenic vein, changes in hepatic blood flow, ascites (Figure 2), hepato-renal syndrome [15]. Increased portal pressure leads to the development of collateral circulation between portal vein system (with high pressure) and caval veins system (with reduced pressure). These portal-systemic shunts generate: gastroesophageal, duodenal, colonic, gallbladder varices, spontaneous splenic-renal shunts, permeability of umbilical vein [3, 6].

Although splanchnic arterial flow is rising (through arterial vasodilatation), portal flow tends to decrease due to raised sinusoid resistance and portal-systemic shunts. In some patients, the shunted blood flow may be important. The reduced portal flow is partial compensated by the increased arterial hepatic flow due to hepatic arterial buffer response. In end-stage of hepatic cirrhosis, arterial hepatic flow can not compensate the decreased portal flow, leading to a lowering of hepatic perfusion and subsequently raising cellular injury [12, 14, 16, 17]. A non-invasive method for the assessment of hemodynamic changes in cirrhotic patients is abdominal and Doppler ultrasonography of hepatic vessels (portal vein, hepatic artery) [18 - 20].

In class A Child-Pugh patients, were registered: normal mean portal velocity  $(16.08 \pm 1.17 \text{ cm/sec})$ , hepatopetal portal flow, normal to slowly raised portal vein diameter  $(1.268 \pm 0.012 \text{ cm})$ , slowly increased portal flow  $(1229.51 \pm 90.1)$ ml/min), raised congestion index (0.104  $\pm$ 0.06). Spleen enlargement was present in all cases  $(13.24 \pm 0.91 \text{ cm})$ , spleen vein diameter in splenic hilum slightly raised  $(0.921 \pm 0.188 \text{ cm})$ . Upper digestive endoscopy was imaging esophageal varices of first degree in 3 patients and following Valsalva maneuver in 4 patients. Hepatic artery flow  $(312.6 \pm 18.6 \text{ ml/min})$  and hepatic artery resistivity index  $(0.62 \pm 0.07)$ were normal.

In class B Child-Pugh patients were registered: normal mean portal velocity  $(15.88 \pm 0.37 \text{ cm/sec})$ , hepatopetal portal flow. not influenced respiratory by movements (Figure 3), raised portal vein diameter  $(1.331 \pm 0.121 \text{ cm})$  (Figure 4), raised portal vein flow  $(1507.15 \pm 182.21)$ ml/min), existing a statistically significance difference between these patients and class Child-Pugh patients (p < 0.01). А Congestion index was increased (0.13  $\pm$ 0.09). Spleen longitudinal diameter (15.21  $\pm$ 3.84 cm) and spleen vein diameter (1.262  $\pm$ 0.406 cm) were higher than in classs A Child-Pugh patients, but without statistical significance (Figure 5). Five patients presented second degree and 3 patients third degree esophageal varices. Hepatic artery flow  $(355.48 \pm 84.12 \text{ ml/min})$ , higher than in class A Child-Pugh patients (p>0.05) was in normal range. Resistivity index had a large distribution, from 0.55 (decreased splanchnic resistance) to 0.72 (upper normal intrahepatic resistance) (Figure 6).

In the third group, class C Child-Pugh patients were registered: decreased mean portal velocity ( $10.18 \pm 2.81$  cm/sec), than in class A and B patients (p<0.01), normal or slightly raised portal vein diameter (1.201  $\pm 0.084$  cm), reduced portal flow (728.65  $\pm$
82.64 ml/min) than in Class A and B cirrhotic patients (p<0.01), raised congestion index  $(0.12 \pm 0.07)$ . It was imaging hepatopetal portal flow in 6 patients and hepatofugal portal flow in 4 patients, not influenced by respiratory movements. Spleen longitudinal diameter (16.77  $\pm$  2.82 cm) and splenic vein diameter  $(1.31 \pm 0.825)$ cm) were raised, but without statistical significance. Third degree esophageal varices were found in all patients. Hepatic artery flow rate (548.21  $\pm$  102.21 ml/min) was higher than in class A and B patients (p<0.01) and resistivity index was normal or raised, up to 0.76. Decreased portal flow due to collateral pathways was followed by hepatic artery flow raising and hepatic arterialization in 4 patients.

Similar to other studies [21 - 23], mean portal velocity decreases with the increase in disease gravity (assessed by Child-Pugh classification). A mean portal velocity below 10 cm/sec is associated with a poor prognosis and high mortality [24]. Raised portal flow in class B patients is associated with increased splanchnic flow, while reduced portal flow rate in class C patients is a marker for important portal-systemic shunts (third degree esophageal varices). Congestion index was raised in all cases. Spleen and splenic vein diameters are rising with the severity of disease. Increase of hepatic artery flow, subsequent to decreased portal flow leaded to hepatic arterialization in 4 patients with class C Child-Pugh cirrhosis. Hepatic artery resistivity index has a wide distribution, meaning variability of resistance.

 Table 1. Etiology of hepatic cirrhosis

Etiology	No. of patients	%
Hepatitis B virus	7	28%
Hepatitis C virus	6	24%
Chronic alcoholism	12	48%

Table 2. Child-Pugn classification of cirrilosis in studied patients		
Class	No. of patients	%
А	7	28%
В	8	32%
С	10	40%

Table 2 Child Durch algoritization of simplestic in studied notion to

I able of Hachier finance characteristics of the staated Li oup	Table 3.	Haemod	vnamic	characteri	stics of	the studied	group
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	V		
Parameter		Class Child-Pugh	
(normal value) [9]	А	В	С
Mean portal	$16.08 \pm 1.17$	$15.88 \pm 0.37$	$10.18 \pm 2.81$
velocity			
(15 - 18  cm/s)			
$(15.2 \pm 2.8 \text{ cm/sec})$			
Portal vein diameter	$1.268 \pm 0.012$	$1.331 \pm 0.121$	$1.201 \pm 0.084$
$(1.1 \pm 0.2 \text{ cm})$			
Portal flow	$1229.51 \pm 90.1$	$1507.15 \pm 182.21$	$728.65 \pm 82.64$
(600 -1200 ml/min)			
Congestion index	$0.104 \pm 0.06$	$0.13 \pm 0.09$	$0.12 \pm 0.07$
(<0.10)			
Spleen longitudinal	$13.24 \pm 0.91$	$15.21 \pm 3.84$	$16.77 \pm 2.82$
diameter			
(<12 cm)			
Spleen vein	$0.921 \pm 0.188$	$1.262 \pm 0.406$	$1.301 \pm 0.825$

diameter (in hilum)			
(<0.8 cm)			
Hepatic arterial flow	$312.6 \pm 18.6$	$355.48 \pm 84.12$	$548.21 \pm 102.1$
(300 - 400 ml/min)			
Hepatic arterial	$0.62\pm0.07$	$0.65 \pm 0.05$	$0.71 \pm 0.09$
resistivity index			
(0.6 - 0.75)			
Esophageal varices	Valsalva maneuver	Second	Third degree(10
	(3 patients);	degree(5patients);	patients)
	First degree(4	Third degree(3	
	patients)	patients)	
Others			Hepatic
			arterialization



Figure 1. Sex distribution of the studied patients



Figure 2. Hepatic cirrhosis. Perihepatic ascites



Figure 3. Portal flow without undulating appearance



Figure 4. Dilated portal vein (diameter 1.4 cm)



Figure 5. Splenomegaly. Dilated splenic vein (Color Doppler)



Figure 6. Hepatic artery (IR = 0.71)

### CONCLUSIONS

Hepatic ultrasonography associated with Doppler sonography of hepatic vessels is a

useful method in assessment of portal hypertension in hepatic cirrhosis.

Mean portal velocity decreases progressively with the increase of disease

severity. A raised portal flow, not influenced by respiratory movements is associated with vasodilatation and increased splanchnic arterial flow, while decreased portal flow is significant for important portal-systemic shunts and splenomegaly. Severe portal hypertension generates hepatofugal portal flow. Reduced portal flow is partial

### REFERENCES

- 1. Pascu O., 2004, Cirozele hepatice. In: Grigorescu M (Ed): Tratat de Hepatologie, Editura Medicală Națională, București, 652-671
- 2. Naveau S., Perlemuter G., Balian A. 2005, Epidemiology and natural history of cirrhosis. Rev Prat, 55(14): 1527-33
- 3. Patel N.H. 2002, Portal hypertension. Semin Roentgenol, 37(4): 293-302
- Gatta A., Sacerdoti D., Bolognesi M. et al. 1999, Portal hypertension: state of the art. Ital J Gastroenterol Hepatol, 31: 326-345
- 5. Rockey D. 1997, The cellular pathogenesis of portal hypertension: stellate cell contractility, endothelin and nitric oxide. Hepatology, 25: 2-5
- 6. Garcia-Tsao G. 2006, Portal hypertension. Curr Opin Gastroenterol, 22(3): 254-62
- 7. Iwao T., Toyonaga A., Oho K. et al. 1997, Value of Doppler ultrasound parameters of portal vein and hepatic artery in the diagnosis of cirrhosis and portal hypertension. Am J Gastroenterol, 92(6):1012-7
- Cavaşi A. 2004, Ecografia sistemului vascular port. In: Grigorescu M (Ed): Tratat de Hepatologie. Editura Medicală Națională, Bucureşti, 1126-1135

compensated by an increase in hepatic arterial flow, leading to hepatic arterialization.

This non-invasive diagnosis method offers prognostic information, guiding therapeutically options on long term.

- 9. Dudea S.M., Badea R.I. 2004, (Ed), Ultrasonografie vasculară. Editura Medicală, București,
- 10. Pelletier G. Cirrhosis and its complications. Rev Prat 2005; 55(10); 1135-41
- Nakaji M., Hayashi Y., Ninomiya T. et al. 2002, Histological grading and staging in chronic hepatitis: Its practical correlation. Pathol Int, 52: 683-690
- 12. Bosch J., Garcia-Pagan J.C. 2000, Complications of cirrhosis. I Portal hypertension. J Hepatol, 32: 141-156
- Richardson P., Withrington P. 1981, Liver blood flow. Intrinsec and nervous control of liver blood flow. Gastroenterology, 81: 159-173
- 14. Lautt W.W. 1985, Mechanism and role of intrinsec regulation of hepatic arterial blood flow: hepatic arterial buffer response. Am J Physiol, 249: G549-G556
- 15. Deltenre P., Mathurin P., Barraud H. et al. 2005, Managing the complications of cirrhosis. Rev Prat, 55(14): 1555-63
- 16. Van Beers B.E., Leconte I., Materne R. et al. 2001, Hepatic perfusion parameters in chronic liver disease: dynamic CT measurements correlated with disease severity. Am J Roentgenol, 176: 667-673
- 17. Kleber G., Steudel N., Behrmann C. et al. 1999, Hepatic arterial flow volume and reserve in patients with cirrhosis: use of intra-

arterial Doppler and adenosine infusion. Gastroenterology, 116: 906-914

- 18. Sacerdoti D., Merkel C., Bolognesi M. et al. 1995, Hepatic arterial resistance in cirrhosis with and without portal vein thrombosis: relationships with portal hemodynamics. Gastroenterology, 108: 1152-1158
- 19. Haktanir A., Cihan B.S., Celenk C. et al.
  2005, Value of Doppler sonography in assessing the progression of chronic viral hepatitis and in the diagnosis and grading of cirrhosis, J Ultrasound Med, 24(3): 311-21
- 20. Tchelepi H., Ralls P.W., Radin R. et al. 2002, Sonography of diffuse liver disease. J Ultrasound Med, 21: 1023-1032

- 21. Chawla Y., Santa N., Dhiman R.K. et al. 1998, Portal hemodynamics by duplex Doppler sonography in different grades of cirrhosis. Dig Dis Sci, 43: 354-357
- 22. Iwao T., Toyonaga A., Oho K. et al. 1997, Value of Doppler ultrasound parameters of portal vein and hepatic artery in the diagnosis of cirrhosis and portal hypertension. Am J Gastroenterol, 92: 1012-1017
- 23. Shi B.M., Wang X.Y., Mu Q.L. et al. 2005, Value of portal hemodynamics and hypersplenism in cirrhosis staging. World J Gastroenterol, 11(5): 708-711
- 24. Zoli M., Ierverse T., Merkel C. et al. 1993, Prognostic significance of portal hemodynamics in patients with cirrhosis. J Hepatol, 17: 56-61

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# **RETROSPECTIVE STUDY UPON THE SEXUAL BEHAVIOUR OF SOME TEENAGERS LIVING IN THE WESTERN PART OF ROMANIA IN RELATION TO FAMILY FACTORS**

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### REZUMAT

**Obiective:** Studiul are ca obiectiv cunoașterea influenței pe care mediul familial o poate avea asupra sexualității tinerilor actuali. **Material și metodă**: Studiul a fost efectuat pe un lot de 782 de liceeni, cu vârste între 14 și 18 ani, din orașul Oradea, în anul 2008, folosind metoda chestionarului. **Rezultate**: Majoritatea tinerilor, în special fetele, au primit informații de la părinți referitoare la sexualitate. Faptul că tinerii locuiesc împreună cu părinții sau că părinții le fixează anumite reguli de comportament nu a reprezentat o piedică în calea începerii vieții sexuale. Băieții au o relație mai bună cu părinții decât fetele, mai ales cei care au deja o viață sexuală. S-a remarcat faptul că adolescenții care întrețin relații sexuale sunt mai detașați și mai puțin supravegheați de către părinți. **Concluzii:** Părinții sunt principalii factori de responsabilitate care trebuie să înceapă educația sexuală a tinerilor pentru a evita traumatizarea acestora.

Cuvinte cheie: viață sexuală, adolescență, părinți, educație

### ABSTRACT

**Objective**: This study is aiming to present the influence of the family environment upon the sexuality of young people today. **Material and Methods**: The study has been conducted in 2008 on a sample of 782 high-school pupils from Oradea, age between 14 and 18, and has used the method of the questionnaire. **Results**: Most young people, especially girls, have discussed aspects related to sexual life with their parents. The fact that most adolescents live with their parents, who establish certain rules of behavior does not represent an obstacle for the beginning of sexual life. Boys have a better relationship with their parents, especially the sexually active ones. Teenagers who already have sexual relationships turn out to be more independent and less supervised by parents. **Conclusions**: Parents are the main factors of responsibility for the sexual education of teenagers, in order to prevent young people from experiencing traumatic situations.

Key words: sexual life, teenage, parents, education

### **INTRODUCTION**

Nowadays human nature seems to go through a period of dramatic transformations. Especially in the case of young generations, the roles of sexual behavior present a change, since more than ever before the values of eroticism and sexuality are promoted by modern society [1-3].

Currently teenagers have more contact with different mass media and are bombarded with an amount of information that is much larger than in the case of any other previous generation; besides that, they seem to idolize their friends, while they try to limit contacts with their families [4,5].

Recent research has indicated that, for teenagers, the major source of information concerning sexuality is represented by friends, schoolmates, those close to their age, or different forms of media, especially magazines. They rarely approach parents and teachers in order to discuss their sexrelated problems or curiosities. In most situations, sexual education is shaped by the points of view of friends or other acquaintances, which often lack or possess inaccurate information regarding sexuality [6].

Young people point out that they don't have easy access to places where they could be informed and advised about sexual health or sexuality in general. Thus families have a crucial role in educating teenagers in sexuality-related issues; however, parents are sometimes lacking information on sexual aspects themselves, or fear that such conversations with their children might be interpreted as a form of consent for their children' beginning of sexual life. Usually voung people are reluctant or embarrassed to have conversations about sex with adults. for fear that they might feel uneasy or that their right to confidentiality will be disregarded. Both teenagers and their parents might encounter difficulties in openly talking about sex-related issues.

Today young people have more freedom; therefore they need a different system of school and family education, in order to learn how to use their liberty, how to make the most appropriate decisions and naturally manifest their own sexuality.

### **MATERIAL AND METHOD**

The study has been conducted in 2008 on a group of 782 high-school pupils from Oradea, age between 14 and 18.

The size of the necessary representative group has been calculated starting from the school population matriculated in Oradea municipality high-schools, in the study year 2007-2008, using the EPIINFO 6.04d, 2001 software created by CDC (Center of Disease Control and Prevention) in Atlanta, adapted to medical statistics processing.

Cluster sampling has been used in order to determine the representative group while calculations took into account a desired accuracy of results of +/-5%, a 95% confidence interval, prevalence estimated to 50% and a 3 design effect [7].

The method of the retrospective descriptive epidemiological survey has been used, which is based on questionnaires aiming to determine aspects concerning the beginning of sexual life at teenagers and the influence of family environment and education upon it, from the perspective of the inquired young people. The ultimate purpose of the formulated questions has been to identify the targets of some subsequent prevention programs, with the view of protecting young people from potential risks. The questionnaire we have used here is based on traditional questionnaires, used for the investigation of risk behavior: the YRBSS 2005, the CAST 2002 – DSP Timis, the UMF Timisoara and the ISP Timisoara questionnaires, CORT 2004 [8-12]. Items concerning the family situations and the relationship of adolescents with their families have been added. Data was processed with the help of the computer, using the mathematical-statistical method.

### RESULTS

The evaluated group was composed of 476 girls (60.9%) and 306 boys (39.2%) (Figure 1). The distribution in terms of sex indicates a girls/boys ratio of 1.6:1.



Figure 1. Distribution of subjects in terms of sex

Statistics have indicated no significant differences between girls and boys with regards to the age-related distribution (p=0.9638). 55.6% of high-school pupils were between 16 and 17 years old (Figure 2).



Figure 2. Distribution of subjects in terms of age and sex

A little more than one third of the total number of subjects (34.3%) have given an affirmative answer to the question: "Did you have sexual relations", of which 117 are girls, representing 24.6 % of the total number of girls and 151 boys, representing 49.3% of boys.

Of the 268 high-school pupils (34.3%) who have begun sexual life, 43.7% are girls and 56.3 % are boys. The boys/girls ratio has been of 1.3:1.

The most significant difference in terms of the boys/girls ratio can be observed at the age of 16, when 47.9% of the boys have already had sexual relations, while only 21.0% of the girls declared to have sexual relations. At both girls and boys, the most extensive rate of increased prevalence of sexual relations appears between the ages of 15 and 16 (11.4% at girls and 31.2% at boys) (Figure 3).



Figure 3. The prevalence of sexual relations in terms of sex and age

It could be observed that, from the entire number of the 14 years old teenagers belonging to the sample group, none acknowledged the presence of sexual relations.

In the questions that followed, the subjects were asked about their relationship with the members of their families; 12 pupils (6 boys and 6 girls), representing 1.53% of the entire group preferred not to give information about their families. Valid answers were obtained from 770 pupils, of which 61.03% were girls and 38.96% boys. Of these, the great majority stated that they had had conversations with their parents about sexuality, a larger percentage being obtained in the case of girls (65.5%), as compared to only 54% in the case of boys. The other adolescents (39%) declared they had never spoken or had only accidental conversations with their parents on sexual issues.

Girls appear to discuss more sex-related issues with their parents, whether they have started their sexual life or not (75.7%, as compared to the percentage of 58.8% boys) (p=0.0023), respectively 62.3% versus 49.3%) (p=0.1848). The teenage girls and boys who have started their sexual life appear to discuss more with their parents about sex-related issues than the teenagers who are not sexually active (girls: 75.7%

versus 62.3%, p=0.0207; boys: 58.8% versus 49.3%, p=0.0862) (Figure 4).



Figure 4. Sex distribution of pupils according to sexual relations and the sexual education received from parents

The great majority of teenagers live in organized families (84.9%), 85.6% girls and 83.8% boys (p=0.8808). 9.6% pupils belong to disorganized families (single parents, divorced or deceased parents) and 5.5% to reorganized families (remarried parent). It appears that the percentage of young people belonging to organized families who have started their sexual life (79.2%) is close to

that of young people without sexual life (87.9%); by comparison, in reorganized families, the percentage of sexually active young people is 2.5 times higher than the percentage of sexually inactive adolescents, while in the case of disorganized families, the ratio of sexually active and sexually inactive young people is of 1.4 (Figure 5).



Figure 5. Distribution of subjects in terms of sexual relations and family organization

Teenage girls who come from reorganized or dysfunctional families and started their sexual life form a more significant percentage (23.3%) than the ones who did not have sexual relations and belong to similar types of families (11.5%). As far as boys are concerned, the ones belonging to reorganized families and having had sexual relationships proved more numerous (8.8%) than the ones who did not have sexual relationships (2.7%) (Figure 6).



Figure 6. Distribution of subjects in terms of sex, sexual relations and family organization

The great majority of teenagers included in this study (92.2%) live together with their families; there are no significant differences between boys and girls with regards to sex life (p>0.05) (Figure 7).



Figure 7. Distribution of subjects in terms of sex, sexual relations and locative status

In terms of sex and locative status, there were no significant differences between the teenagers who started their sexual life and those with no sexual relations (p>0.05). Pupils living together with their families, who declared they had sexual relations (89%) are rather similar in number with those who did not have sexual relationships (93.9%).

Girls who lodged at somebody's house were less likely to have sexual relations, as indicated by the high percentage of girls with no sexual relations (2.8%), as compared to the percentage of girls who declared they had sexual relations (0.9%).

In the case of boys, sexual relations are present especially at those who declared

they lived alone. (5.2%, as compared to 0.7%).

In terms of relationships with their parents, about 2/3adolescents have declared themselves satisfied (75.2%), especially boys (78.4% versus 73.1% girls), but there are no significant differences in this respect (p=0.9661). About a fifth (19.2%) proved irresolute as far as the relationship with their concerned, 5.3% parents is declared themselves dissatisfied, while 0.4% declared the absence of parents. It appears that sexually inactive adolescents have a better relationship with their parents (79.4%), as compared to the 67.2% represented by adolescents, sexually active but the differences are not significant (p=0.8273) (Figure 8).



Figure 8. Distribution of subjects in terms of sexual relationships and relationships with their parents

Irrespective of their situation in terms of sexual life, the percentage of boys having a better relationship with their parents is higher than that of girls, especially in case of sexually active adolescents (72.2% versus 59.7%). The distribution of pupils in terms of sex indicates the fact that, in general, girls (6.9%) are 2.5 times more often dissatisfied than boys (2.7%) regarding the relationship they have with their parents.

The subjects considered for this study have been asked whether their parents have set firm rules concerning their activity inside and outside the home; only 12.1% declared they have to obey strict, durable rules, 26% say that their parents have almost never established any rule and 61.8% of parents have set rules occasionally.

31.2% of the sexually active adolescents have to obey no fixed parental rule, and from among the sexually inactive ones, only 13.5% have to obey rules related to actions they are allowed to perform (Figure 9).



Figure 9. Distribution of subjects in terms of sexual relations and rules established by parents

An important and equal percentage of both sexually active and sexually inactive teenagers declared that their parents have established rules only occasionally (41.4% and 41.85%).

The most numerous among the pupils with sexual relations were those whose parents imposed rules only occasionally (41.4%), being followed by those with no permanent rules imposed by parents (31.2%), and then by those whose parents often impose rules (18%); the least numerous were those teenagers whose parents impose rules almost always (9.4%). As compared to the case of boys, the parents of girls belonging to the sample group have often or almost always established rules (36%). The boys whose parents did not establish rules of

behavior in and outside the house and declared having sexual relations formed a larger percentage (34.2%) than the ones without sexual relations (20.3%).

Girls are more compliant and respect rules in a larger percentage than boys (34.3% as compared to 22.6%). Pupils with no sexual relations, who often or almost always obey the rules imposed by parents, are more numerous (62.8%) than the pupils with sexual relations (50%).

The percentage of sexually active adolescents who do not obey rules is over 2 times larger than the percentage of sexually inactive teenagers, who present the same attitude (Figure 10).



Figure 10. Distribution of subjects in terms of sexual relations and the respect for rules established by parents

In the case of both sexes, the lowest percentage is composed of teenagers who almost never obey parental rules, weather they have started or not their sexual life.

51.3% of the subjects have declared that their parents know where and with whom they spend their spare time, of which 61.3% are girls and 35.5% are boys.

In the case of both the sexually active and the sexually inactive subjects, the parents of girls know more details about the way their children spend their time than in the case of boys.

The number of parents who only sometimes or rarely know about the way their children spend their time is larger in the case of sexually active teenagers (31.7%), as compared to the situation of sexually inactive adolescents and their parents (21.3%) (Figure 11).



Figure 11. Distribution of subjects in terms of sexual activity and the awareness of their parents about the way they spend their free time

There were no significant differences between the girls and the boys, with or without sexual relations, whose parents are informed about the way they spend their spare time.

However, the percentage of both girls and boys with sexual relations, whose parents almost never know the way they spend their spare time (girls -6.9%, boys -10.7%) is larger than in the case of teenagers without sexual relations (girls -2.5%, boys -3.3%).

### DISCUSSIONS

Among the situations that determine an earlier beginning of sexual life one can mention: single-parent families (the adolescents who live with only one parent are more likely to be sexually active than the ones living with both parents; the divorce of during parents the early stages of adolescence has been associated with an increase of sexual activity in the case of adolescent girls); the influence of a close member of the family (especially elder sisters who are sexually active or have a child) [13].

Recent studies indicate the fact that educational establishments confront with

difficulties caused by the inappropriate training of the teaching staff in the field of sanogenetic education and by the insufficient number of informativeeducative materials [14].

### **CONCLUSIONS**

34.3% of the high school pupils who provided information for this study declared that they have already started their sexual life, of them 24.6% being girls and 49.3% boys. An increased prevalence of sexual relations is specific to the age-segment made up of 15 and 16 years old adolescents, 66.2% of the adolescents who have started their sexual life, as compared to the percentage of 58.4% of adolescents who are not sexually active, declare they have conversations with their parents about sexual life, especially girls. The family organization seems to have no major influence upon the beginning of sexual life, though in disorganized or reorganized families the presence of sexually active adolescents is more frequent. 86.5% of boys and 92.3% of girls who are sexually active declared they live together with their parents, which indicates that this situation does not represent an impediment for the manifestation of sexuality. The adolescents who have not started their sexual life have a better relationship with their parents (79.4%). An important percentage of high school pupils whose parents have set rules of behavior (31.2%) declared themselves sexually active.

The results of this study indicate that sexual education is first and foremost the

### REFERENCES

- 1. Neamţu C. , 2005, Sexual Education A Challenge for the Romanian Education, Published by The European Institute, 15-44
- Tyron C., Lilienthal J.W., Havinghurst R.J.,apud. Cerghit I., Neacşu I.,Negruţ-Dobridor I., Pânişoară I.-O., 2001, Pedagogical Lectures, Polirom Printing House, 48
- Varadi Goia I., 2004, A Guide to Self-Discovery and the Conduct of Mental Life, Dacia Printing House, Cluj-Napoca, 12: 48, 13:54
- 4. Levesque R.J.R., 2007, Adolescents, Media, and the Law: What Developmental Science Reveals and Free Speech Requires, Oxford University Press US
- 5. Arp C. & D., 2006, They are Suddenly 13 – or the Art of Hugging a Cactus, Scriptum Printing House,13
- 6. Fiske B., 2004, The sexual brain, Nature Neuroscience, 7, 1029
- 7. Ursoniu S. et al, 2004, CORT 2004, Methods of Questionnaire Sampling and Testing, Journal of Hygiene and Public Health, 54, 3/ 2004, 145-148
- 8. \*\*\*, Public Health Administration Timiş, University of Medicine and Pharmacy Timişoara-Questionnaire CAST 2002;

responsibility of the family and should be initiated early, since parents generally have the necessary tact for approaching such a delicate subject; this form of education will be supplemented later with age-appropriate information in the school education environment.

- 9. Grunbaum JA, Kann L, Kinchen S, Ross J, Lowry R, Harris W, McManus T, Chyen D, Collins J: Youth Risk Behavior Surveillance – United States, 2003, http://www.cdc.gov/mmwr/pre view/mmwrhtml/ss5302a1.ht m
- 10. \*\*\*, National Center for Chronic Disease Prevention and Health Promotion. YRBSS: Youth Risk Behavior Surveillance System.2005 http://www.cdc.gov/HealthyY outh/yrbs/pdfs/2005highschool questionnaire.pdf
- University of Medicine and 11. Pharmacy Timişoara, Institute of Public Health "Prof. Dr. Leonida Georgescu" Timi-Public Health soara. Administration of Timis County: Evaluation of risk behaviour dimension for the health of high school/vocational pupils and univesity students from Timis county. CORT 2004
- Vlaicu B., Fira–Mladinescu C, Ursoniu S., Petrescu C., Suciu O., Ciobanu V., Silberberg K., Korbuly B., Vernic C., Radu I., Porojan G., Caraion C., Questionnaire CORT 2004, Review of Public Health and Hygiene, vol 54, no. 3 / 2004
- 13. \*\*\*, Futris T.G., McDowell U., Adolescents at risk: Sexual Activity. http//:www.ohioline.osu.edu/fl

m02/FS13.html;	accesat
28.01.2006	

14. Lazăr A., Bitea Z., Sonea N.C., Dinescu C., Suciu R., 2008, Aspects Concerning the Perception of Health Education in Schools by the Teaching Staff in Bihor County, Jounal of Hygiene and Public Health in Romania, vol. 58, nr. 2, 95-96

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### FRUIT AND VEGETABLES – THEIR IMPORTANCE FOR WEIGHT LOSS

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### REZUMAT

Datele epidemiologice indică o dublare sau chiar o triplare a prevalenței obezității în ultimele decade în S.U.A., Europa, dar și în unele țări în curs de dezvoltare. O metodă de a scădea riscul de afecțiuni cronice datorate stilului de viață, inclusiv obezitatea, este creșterea aportului de fructe și legume. Există un număr de motive pentru care se face această recomandare. În primul rând, fructele și legumele se pare că au un efect de reducere a aportului energetic total. Ele au densitate energetică scăzută, conținut crescut de apă. Metabolismul particular al fructelor le conferă acestora posibilitatea de a preveni creșterea greutății corporale. Sunt necesare intervenții nutriționale bazate pe studiile teoretice pentru a promova consumul de fructe și legume, în special la grupul de vârstă 18-24 de ani, aceste fiind grupul care va influența starea de sănătate a generației următoare. Pentru a înțelege mai bine de ce schimbarea nutriției este atât de dificilă, trebuie investigate barierele interne și externe care apar în calea acestei modificări a stilului de viață.

Cuvinte cheie: obezitate, fructe, legume, scădere în greutate

### ABSTRACT

Epidemiological data indicate that the prevalence of obesity doubled or even tripled during the last decades in U.S., Europe, also in some developing countries. A way to decrease the risk for chronic diseases due to lifestyle, including obesity, is to increase the fruit and vegetables intake. There are a number of reasons to make this recommendation. First of all, fruit and vegetables seem to have the effect of decreasing the total energy intake. They are low-energy-dense foods, and they contain large amounts of water. The metabolism of fruits makes them able to prevent the increase of body weight. Theory-based nutrition interventions are necessary in order to promote the fruit and vegetables consumption, especially in the 18 to 24 year old age group, because they have the potential to influence the health status of the next generation. For better understanding why the nutrition change is so difficult, internal and external barriers to eating a healthy diet must be investigated.

Keywords: obesity, fruits, vegetables, weight loss

### **INTRODUCTION**

Some 20–25% of UK adults are obese according to the WHO criterion (BMI >30 kg/m2). Type 2 diabetes, increasingly recognized as a major complication of

overweight and obesity, is beginning to appear in UK adolescents, following the trends in the US. Epidemiological data indicate that the prevalence of overweight and obesity has doubled or tripled in the past few decades in the US, in Europe, and even in many developing countries. Thus obesity

is increasingly seen as a public health problem requiring concerted action by both governmental and non-governmental organizations. A sound understanding of the root causes is crucial, if strategies for the prevention and treatment of this epidemic are to be developed. Many epidemiological studies suggest that physical activity at work, school or at leisure has declined to minimal levels, and that sedentary behaviors such as television viewing and computer games have become major pastimes. Thus energy requirements are substantially less than those for recent generations. Further the food industry produces high-calorie foods which children and adults consume as snack meals, giving a substantial surfeit to their daily energy requirement. In children, a few school based, preventive intervention trials have shown some promising results. Many negative trials have also been reported, and practical difficulties remain in widespread implementation the of appropriate protocols. Initiatives have been introduced by the government to increase the physical education syllabus in school to a minimum of 2 h/week, and the promotion of fruit and vegetables. Further research is required on the physiological and psychological causes of overweight and obesity in children and adults. and randomized, controlled, school and community-based trials are required to pilot preventative initiatives. Monitoring of the progress in prevention at both organizational and outcome level is required, and also of adverse outcomes such as a rise in the prevalence of eating disorders [1].

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### THE INFLUENCE OF FRUIT AND VEGETABLES ON BODY WEIGHT

Overweight and obesity are some of the most challenging and steadily rising public health problems worldwide. Strategies to effectively reduce and maintain a healthy body weight are urgently required. A number of national and international bodies recommend an increased intake of fruits and vegetables in order to decrease the risk of developing lifestyle-related diseases including overweight and obesity.

The risk-reducing effect of fruits and vegetables on overweight and obesity may in part be exerted through their possible reduction upon the total energy intake. This may be explained by various factors. Fruits and vegetables are low in energy density, high in water content and they contain a considerable amount of dietary fibers, soluble dietary fibers in particular. Lowenergy-dense foods are characterized as foods that contain relatively low amount of energy per unit food weight. According to some short-term studies, food intake is seemingly regulated by the weight of the food ingested rather by the energy content. When consuming low-energy-dense foods, satiation may occur relatively early and the feeling of satiety may persist for a relatively long period. Hence, substitution of highenergy-dense foods with low-energy-dense foods, such as fruits and vegetables, could potentially decrease the total energy intake.

Soluble dietary fibers, abundant in fruits and vegetables, reportedly also decrease total energy intake and can consequently cause body weight reduction. This may partly be due to a dilution of the energy density of the diet and partly a delay in gastric emptying of the ingested food. Thereby, the feeling of satiation and satiety increases, causing a reduction in the total energy intake. In addition, soluble dietary fibers form a gellike environment in the small intestine, resulting partly in decreased activity of the enzymes involved in the digestion of fat, protein and carbohydrates and partly in the capture and subsequent loss of these energyyielding macronutrients, resulting in overall lowered energy absorption. The gel-like environment in the small intestine and the subsequent slow digestion of the nutrients may also presumably prolong the contact of the nutrients with receptors in the small intestine, potentially causing the release of putative satiety peptides. Another aspect of dietary fibers in relation to the satiety is that they decrease the glycaemic index of the food. The glycaemic index compares the incremental area under the blood glucose response curve of, usually, а 50g carbohydrate portion of a test food relative to 50g of a standard food, following ingestion by the subject. Foods with low glycaemic index generate small and sustained elevation in postprandial blood glucose concentrations, which may be associated with long-term satiety [2].

Insufficient fruits and vegetables in the diet are usually associated with other unhealthy behaviors, such as television viewing. Watching TV more than 2 hours a day was associated with being overweight, being sedentary and eating insufficient fruits and vegetables among White males and females. Television viewing may promote obesity both by displacing participation in physical activity that would expend more energy, and by increasing dietary energy intake, either during viewing or as a result of food advertising. Other than sleep, time spent watching TV represents the single greatest source of physical inactivity among American children. In addition, evidence suggests TV viewing relates inversely to measures of physical fitness, participation in physical activity, and active involvement in sports. Both snacking while watching TV and between meals snacking relate directly to the amount of TV viewed. Exposure to food advertisements may produce incorrect nutritional beliefs among children. Television advertising and programming tend to emphasize high-calorie foods of poor nutritional quality, rather than nutritionally rich foods such as fruits and vegetables. Increased TV viewing among children and adolescents has been associated with potentially unhealthy dietary practices, such as increased consumption of high-fat foods. In the United States, diets high in fat tend to be low in fruits and vegetables and complex carbohydrates [3].

of А number observational and interventional studies have investigated the possible association between fruit and vegetable intake and body weight. Most of these studies find an inverse association. In a review [2], emphasis is given to the role of fruits alone and the risk of developing overweight and obesity. The rationales for this are several: fruits are typically consumed at other occasions than vegetables as they can be obtained in various physical forms, such as fresh, dried, canned, pureed, making them convenient as between-meal snacks, potentially substituting more energy-dense snacks; the culinary use of fruits differs from that of vegetables. For example, because of the various physical forms and commonly sweet taste, they are suitable as deserts. Also, here they may act as the relatively healthier alternative to the traditionally more energy dense deserts and fruits are frequently consumed raw, whereas vegetables are often prepared by addition of fatty substances, which diminishes the low energy-dense characteristics of vegetables. Although, to the best knowledge of the differential authors. the plausible physiological mechanisms of fruit and vegetables have not been explored, fruits possess a distinct physical profile, which may be manifested differently in relation to body weight status. Fructose, the main sugar in fruits, has a relatively low glycaemic index [4], producing a slow increase in postprandial blood glucose followed by a possible increase in satiety. The slow absorption may also increase satiety as a result of extended contact time with the gastrointestinal receptors that produce satiety signals. Another factor that may connect fructose to satiety involves incomplete absorption of fructose with subsequent hyperosmolar environment in the colon [5]. This results in attraction of fluids into the gut lumen, causing a feeling of indisposition and lost interest in further food consumption. Based on these and other as yet unknown probable factors, the authors find it appropriate to distinguish between

fruits and vegetables in relation to overweight and obesity [2].

### STRATEGIES TO INCREASE FRUIT AND VEGETABLES INTAKE

Relatively long-term behavioral intervention studies among free-living individuals examining the effect of fruit intake on body weight have been performed [6]. However, they failed to examine the independent effect of fruit intake, as they did not only advise the subjects to increase their fruit intake, but rather encourage them to pursue a generally healthy lifestyle, including increasing vegetable intake, decreased fat and sugar intake and increased physical activity level.

In Australia in 2004-2005, 62% of male and 45% of female adults were reported as obese. The main cause of obesity is an increase in consumption of energy-dense foods combined with a sedentary lifestyle. The Nutritional Health Survey (NHS) in 2006 indicated that 86% of Australians between 18 and 64 years do not consume the recommended five serves of vegetables each and 46% do not consume the dav recommended two serves of fruits each day. Hence there is a need for intervention strategies to increase fruit and vegetables Australian intakes among the adult population to assist in the reduction of chronic disease and obesity.

Weight loss programs provide opportunities for dietary intervention to address obesity. However, low energy diets can provide inadequate nutrition. For example, there is evidence that individuals on a weight loss diet may be at risk of inadequate calcium intake. Dairy products, which contribute approximately 50% of daily calcium requirements, are recommended as the major source of dietary calcium. However, 45% of women and 38% of men surveyed in the NHS had consumed less than one serve of dairy products the previous day which is

well below the recommended two to three serves per day for women and two to four serves per day for men. Increased consumption of low fat dairy products may assist in maintaining adequate dietary calcium on lower energy intake. The study presented here [7] aimed to compare the fruit, vegetable and dairy intakes of two strategies to increase fruit, vegetables and reduced/non-fat dairy intake in man participating in a weight loss intervention. One of the strategies used specific daily targets to increase these foods, while the other strategy was based on a general low fat diet with general advice to increase these foods. At the end of the 12 week both intervention period, groups had achieved similar mean weight loss, with subjects losing an average 5-6% of total body weight. The group which followed the WELL (weight loss, exercise, lowered blood pressure and longevity) diet consumed a diet closer that was the current to recommendations of fruits, vegetables and dairy products, and therefore were more likely to benefit nutritionally than those on the low-fat diet. If "time taken" to achieve dietary targets is used as a measure of success, the increased fruit intake (achieved in week one and maintained to week 12) by the WELL group appeared easier to achieve than increased intakes of vegetables or dairy (achieved in weeks 6 and 8, respectively). This may be due to the ease with which fruit is consumed with limited preparation time and acceptance as an appropriated betweenmeal snack [7].

US national surveys also show that 18- to-24-year old are not consuming enough fruits and vegetables. Theory-based nutrition interventions, e.g. stage-tailored education programs, are needed for promoting fruit and vegetable consumption in this age group, which is in transition from adolescence to adulthood and has the potential to influence the health status of the next generation. Accurate stage assignment is the basis for developing effective stagetailored interventions. Previous literature revealed that young adults tend to consume excess amounts of total fat, saturated fat, cholesterol and sodium. Other studies have found inadequate intakes of essential micronutrients, such as calcium, iron, zinc, folate, and vitamins A, B6 and C, as well as low consumption of fruits and vegetables. Promotion of dietary change among young adults, who are currently healthy, could be especially challenging. Potential future health benefits of a balanced diet, which are the principal emphases in many of the current guidelines, may not seem as appealing to this particular population as immediate physical and psychological benefits.

The stage of change construct, the core of the Transtheoretical Model, has recently received increasing interest from researchers in the nutrition field. The staging algorithm method developed by Prochaska and DiClemente for smoking cessation has been widely adopted in studies of other health problem behaviors and appears to have become a customary method for assessing stage of change. However, dietary behaviors are more complex than smoking cessation with regard to many aspects such as continuity, variability as well as essentiality and risk for health. The validity of staging algorithms for dietary behaviors depends largely on people's ability to accurately perceive and evaluate their own diets, which in turn are determined by individuals' knowledge, attitudes and beliefs concerning behavior. Unfortunately, the public self-awareness about knowledge and nutrition and diet appears to be at a lower level compared with that about other dietary lifestyle behaviors. Accurate assessment along with self-indicated readiness to change is the key to correct stage assignment, which in turn may be important for developing effective nutrition intervention, and predicting changes in dietary and psychosocial measures. Taking fruit and vegetable intake as an example, intervention messages tailored towards the non-reflective action stage may focus on benefits of the behavior and strategies for maintaining or even increasing the current intake. Likewise, individuals who mistakenly consider themselves to be in maintenance or action could be given nutrition education that makes them aware of their misconception and encourages them to make changes [8].

### BARRIERS TO EATING A HEALTHIER DIET

Among the many influences on diet are availability, cost and time, which can be seen as "external" to the person. These contrast with "internal" factors such as tastes and preferences. Foremost among the external barriers to eating a healthy diet is cost. Focus groups, surveys and interview studies have repeatedly shown that the relatively high cost of fruits and vegetables is a barrier to healthy eating for people on low incomes. Socially deprived areas may lack local sources of reasonably priced, good-quality fruit and vegetables, causing a vicious circle of poor demand and supply. People on lower incomes have less access to cars and out-of-town shopping centers, and are less able to carry and transport food in factors Other external include bulk. availability in the workplace, where many canteens offer relatively poor value for fresh salads, vegetables and fruit compared with high turnover "fast foods". The perception that fruits and vegetables are timeconsuming to prepare is a frequently cited barrier.

Families exert a strong external influence on diet. Women are much more likely than men to prepare main meals and shop, but describe little control over what is eaten, and a need to juggle the tastes of their husbands and children.

While families and other external factors are clearly influential, many people cite "internal" barriers such as habit, tastes and preferences. Liking the taste of fruit and vegetables is, unsurprisingly, a strong predictor of whether the foods are eaten.

Jeyanthi and Ziebland (2004) compared the barriers to eating more fruit and vegetables reported before and after participation in a 6-month randomized controlled trial in primary care. At the initial intervention appointment of a primary care intervention to promote eating five or more portions of fruit and vegetables a day, participants were asked to identify the barriers that they thought they might encounter. Barriers were discussed again at the final appointment 6 months later. All the barriers that were anticipated at the start of the trial were also reported at the end of the trial. Most common among these were household preferences including the reluctance of (male) partners and children to eat fruit and vegetables, and the additional time required to prepare these foods. However, some barriers (e.g. the problem of getting fruit and vegetables when traveling or when the daily routine is disrupted such as at weekends) were only encountered once participants tried to make changes to their fruit and vegetable intake. In this small qualitative study it was only male partners who were described as obstructing the attempt to eat more fruit and vegetables, while men believed that their female partners would support the change. This may be because of the role that women take in providing nourishment and looking after the health of the family. Another explanation is that vegetables and fruits are viewed as feminine foods. In Lupton's Australian study she "There concludes: is symbiotic а

### REFERENCES

1. Skidmore P.M.L., Yarnell J.W.G., 2004, The obesity epidemic: prospects for prevention, metaphorical relationship between femininity and vegetables: the eating of vegetables denotes femininity and femininity denotes a preference of vegetables. A similar relationship exists for masculinity and meat eating."

In a British intervention study, few participants took up the option of vegetarian meals, preferring to eat fruit as a dessert or snack, or drink fruit juice to attain their target. For some participants changing to a diet that includes vegetarian dishes may be unappealing.

A final important observation is that although all but three of the respondents in this qualitative study described experience of at least one barrier to eating more fruit and vegetables, three-quarters (29 of 40) reported that they succeeded in increasing their fruit and vegetable intake, as well as giving convincing accounts of how the changes had been made. While we cannot be sure why the intervention was successful, we suspect that contributory factors were that it was based on a simple, positive, noncontroversial message to increase fruit and vegetables consumption to five or more portions a day; that the action plan was determined by the preferences of the participant; that alternative approaches to reaching the five-a-day target were discussed; and that the intervention was supported by take-home materials including a pictorial portion guide. The accounts from the qualitative interviews suggest that participants adapted their initial plan if it was hard to maintain in practice. These findings support the development of health interventions promotion which offer flexibility rather fixed targets which may not be achievable by everyone [9].

> Oxford Journals, QJM: An International Journal of Medicine, Vol.97, No.12

2. Alinia S., Hels O., Tetens I., 2009, International Association for the Study of Obesity, Obesity Reviews

- 3. Lowry R., Wechsler H., Galuska D.A., Fulton J.E., Kann L., 2002, Television Viewing and its Associations with Overweight, Lifestyle, Sedentary and Insufficient Consumption of Fruits and Vegetables Among US High School Students: Differences by Race. Ethnicity, and Gender, Journal of School Health, Vol.72, No.10
- Riby J.E., Fujisawa T., Kretchmer N., 1993, Fructose Absorption, American Journal for Clinical Nutrition, Vol.58
- 5. Kneepkens C.M.F., Vonk R.J., Fernandes J., 1984, Incomplete intestinal absorption of fructose, Archives of Disease in Childhood, Vol.59
- Ledikwe J.H., Rolls B.J., Smiciklas-Wright H., Mitchell D.C., Ard J.D., Champagne C., Karanja N., Lin P.H., Stevens V.J., Appel L.J., 2007, Reduction in dietary energy density are

associated with weight loss in overweight and obese participants in the PREMIER trial, American Journal for Clinical Nutrition, Vol.85

- Booth A., Nowson C., Worsley A., Margerison C., Jorna M., 2008, Dietary approaches for weight loss with increased intakes of fruit, vegetables and dairy products, Nutrition and Dietetics, Vol.65
- Ma J., Betts M.N., Horacek T., Georgiou C., White A., 2003, assessing stages of change for fruit and vegetable intake in young adults: a combination of traditional staging algorithms and food-frequency questionnaires, Health Education Research, Vol.18, No.2
- 9. Jeyanthi H.J., Ziebland S., 2004, Reported barriers to eating more fruit and vegetables before and after participation in a randomized controlled trial: a qualitative study, Health Education Research, Vol.19, No.2

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