

ANTHROPOMETRIC AND BODY COMPOSITION INDEXES IN ELDERLY

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REZUMAT

În ultimii ani s-a observat o creștere a populației vârstnice cu vârsta peste 65 de ani. Studiul de față și-a propus ca obiectiv investigarea comparativă a stării de nutriție la o colectivitate de vârstnici instituționalizați și a unui grup de vârstnici neinstituționalizați, utilizând indicatori antropometrici și impedanța bioelectrică. Măsurătorile antropometrice evidențiază la loturile investigate, o creștere a masei adipoase și o repartitie inegală a țesutului adipos, concomitent cu o scădere a pliurilor cutanate la nivelul membrelor.

Cuvinte cheie: vârstnici, antropometrie, stare de nutriție

ABSTRACT

During the last years we have noticed an increased of the population ageing over 65. The present study's objective is to compare the nutritional status between an institutionalized community and a non-institutionalized one, through anthropometric indexes and bioelectric impedance. Anthropometric measurements at the investigated lots showed an increase and uneven distribution of the adipose mass, along with a decrease of the skin fold of the limbs.

Keywords: elderly, anthropometry, nutritional status.

INTRODUCTION

Knowledge of the physiological and medical particularities of this age group is required as it utilize the medical services in greater proportions and also has an increased risk for acute illness.

Body composition changes and fat tissue distribution, with age, may be associated with various physiological changes that may affect the metabolism, nutritional intake, physical activity and the risk of chronic diseases [1].

The evolution of acute illnesses is complex and unpredictable as they appear over a background of chronic illnesses and especially in underfed, with proteins, vitamins and mineral deficits [2].

The nutritional status is influenced by many categories of factors:

- physiological factors/changes
- psychological factors
- economical factors
- other factors:
 - isolation
 - chronic treatments
 - gum/dental pathology

- chronic diseases [3,4].

OBJECTIVE

Comparative evaluation of anthropometric and body composition indexes between an institutionalized community and a non-institutionalized one.

MATERIALS AND WORKING METHODS

There were taken into consideration two lots of elderly:

- 116 institutionalized elderly
- 122 non-institutionalized elderly.

The present study used, beside specific anthropometric measurements (height, weight, leg length, arm length, abdominal perimeter, shank length, thickness of skin fold), a new, non-invasive, modern method in order to determine the body composition – bioelectrical impedance.

The anthropometric measurement techniques are applicable also in laying down position so, they were applied also to elderly persons that could not stand up.

The bioelectric impedance, a relatively new and non-invasive technique for determining the body composition, represents an alternative to the anthropometric measu-

rements, especially in younger people, in elderly showing multiple errors [5-7].

RESULTS

Weight is easily influenced by the environmental factors acting on short term to which you may add the effects of the acute/chronic illnesses or malnutrition; as a result, the changes of weight may require a longer timeframe to measure than measuring the heights.

Values obtained while measuring the brachial and shank perimeter shows a decrease of the adipose tissue of the arm and leg with age, but it grows at the trunk level. The increase of the fat tissue at abdominal and trunk level were highlight by the values of the suprailiac and subscapular skin folds.

According to the performed measurements, there is a smaller percent of adipose tissue in non-institutionalized elderly when compared with the institutionalized ones, showed by smaller values of the skin folds and a lower weight median.

Out of calculation also resulted larger values for muscular mass at the non-institutionalized elderly.

Table 1. Anthropometric parameters in institutionalized elderly

Parameters	Sex	
	F	M
Age (years)	72	77
Height (cm)	157.5	164
Leg length (cm)	41	43
Weight (kg)	81	57
Shank perimeter (cm)	36	27.5

Brachial perimeter (cm)	35	24
Subscapular skin fold (cm)	4.1	0.9
Tricipital skin fold (cm)	3.3	0.8
Bicipital skin fold (cm)	3.4	0.7
Suprailiac skin fold (cm)	3.8	2.5
Fat tissue composition	44.4% 36 kg	36.3% 20.7kg

Table 2. Anthropometric parameters in non-institutionalized elderly

Parameters	Sex	
	F	M
Age (years)	70.5	71.5
Height (cm)	159	165
Leg length (cm)	42.5	43
Weight (kg)	78.5	60
Shank perimeter (cm)	35.5	29
Brachial perimeter (cm)	34	25
Subscapular skin fold (cm)	3.7	0.9

Tricipital skin fold (cm)	2.7	0.9
Bicipital skin fold (cm)	3.1	0.7
Suprailiac skin fold (cm)	3.3	2
Fat tissue composition	40.6 32.9 kg	31.3% 17.8 kg

Table 3. Body composition parameters

Parameters	Sex	
	F	M
Age (years)	72	77
Adipose mass (%)	52.3	42
Adipose mass (kg)	42.36	23.52
Muscular area of the arm (cm²)	41.83	26.8
Total muscular mass (kg)	23.26	17.07
BMI (kg/ m²)	32.92	21.26
Non-adipose mass (kg)	38.63	33.48

Table 4. Body composition parameters for non-institutionalized elderly

Parameters	Sex	
	F	M
Age (years)	72	77
Adipose mass (%)	52.3	42
Adipose mass (kg)	42.36	23.52
Muscular area of the arm (cm ²)	41.83	26.8
Total muscular mass (kg)	23.26	17.07
BMI (kg/ m ²)	32.92	21.26
Non-adipose mass (kg)	38.63	33.48

CONCLUSIONS

Anthropometric measurements for both investigated lots showed an increase and uneven distribution of the adipose mass.

Comparative data shows that in non-institutionalized elderly the percent of adipose mass is smaller and the muscular tonus and physical and psychical status are better.

These differences appear because of extremely reduced physical activity in institutionalized elderly, either because of the lack of a fitness facility, either because of the associated chronic illnesses limiting the effort capacity.

Involving the elderly in appropriate social activities and keeping them as much as possible closer to their family are factors that may increased the quality of life.

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COMORBIDITY INCIDENCE AMONG SMOKING PATIENTS FROM TIMIȘ COUNTY

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REZUMAT

Introducere: Fumatul nu mai reprezintă un obicei „la modă”; mai multe persoane încearcă să renunțe. **Obiective:** ne-am propus să analizăm profilul pacienților care au apelat la " Centrul pentru Consiliere Antifumat " Timișoara. **Material și metodă:** Un lot de 983 pacienți a fost inclus în studiu, pacienți ce au apelat la " Centrul pentru Consiliere Antifumat " Timișoara în perioada 01.01.09-31.12.09. S-a apreciat: statusul fumatului, consumul tabagic, scorul de dependență nicotinică, tentativele anterioare de renunțare la fumat, precum și antecedentele personale patologice ale pacienților. Pentru aprecierea scorului de dependență nicotinică s-a aplicat chestionarul Fagerström. **Rezultate:** 58,4% dintre pacienți nu au boli cunoscute, 41,6% au afecțiuni cardio-vasculare, pulmonare, diabet zaharat, boli mintale. Dintre pacienții cu antecedente personale patologice, un procent mare este reprezentat de bolile cardio-vasculare, 16,8%. Majoritatea fumătorilor au prezentat un grad înalt de dependență la nicotină, 66,9%. **Concluzii:** Mai mult de jumătate dintre pacienți nu au comorbidități. Dintre cei cu comorbidități, bolile cardiovasculare au fost principale. Datorită gradului înalt de dependență la nicotină și a riscului cardio-vascular asociat, este importantă inițierea și susținerea programelor de prevenție a fumatului încă de la vârste fragede.

Cuvinte cheie: fumat, comorbidități, dependență, prevenție

ABSTRACT

Introduction: Smoking does not represent anymore a fashionable "habit"; more people are trying to give up the addiction. **Objectives:** We wanted to analyze the profile of the patients addressing the Counseling Center for Smoking Cessation Timișoara. **Material and method:** A sample of 983 patients was included in the study; they were assessed at the Counseling Center for Smoking Cessation in Timișoara during the period 01.01.09-31.12.09. The assessed characteristics were: smoking status, tobacco consumption, nicotine dependence score, previous attempts of smoking cessation, and personal history of pathological disease. For the assessment of nicotine dependence score, Fagerström questionnaire was applied. **Results:** 58.4% patients had no known diseases, 41.6% had

cardiovascular disease, pulmonary disease, diabetes, mental illness. Among patients with comorbidities a high percentage is represented by cardiovascular diseases, 16.8%. Most smokers have shown a high degree of dependence on nicotine, 66.9%. **Conclusions:** More than half of the patients have not comorbidities. Among those with comorbidities, the main diseases were cardiovascular. Due to the high degree of dependence on nicotine and high cardiovascular risk, it is important to initiate and support smoking prevention programs since early ages.

Keywords: smoking, comorbidities, dependency, prevention

INTRODUCTION

According to WHO estimates, smoking is a very common habit; 1.25 billion people worldwide are smokers. Most smokers start using tobacco before adult age, and among young smokers, approximately 25% smoke the first cigarette before the age of 10 years [1,7]. In most countries, the percentage of young smokers is about equal (with an error of 10%) to that of adults. In other countries, like Egypt and Venezuela, juvenile smoking is lower than in adults, and in some cases, Argentina, Philippines and Russian Federation, there are significant differences gender related, in terms of juvenile smoking and smoking in adulthood [2]. Approximately 215 million Europeans smoke, of which 130 million are men. Risk of developing smoking related diseases, including cancer and heart disease is inversely proportional to the age at which a person begins to smoke. 50% of young people who continue to smoke will eventually die from smoking [1]. The annual number of deaths in Europe attributed to

tobacco consumption is estimated at 1.2 million, representing 14% of all deaths [1].

Addiction is the mental / physical state resulting from the interaction between a living organism with a drug or substance, including behavioral changes like the need to take the medicine continuously or periodically to find its psychological effects and sometimes to avoid discomfort by his absence. In the brain exists a neuron system (in the territory of hippocampus and hypothalamus), which is stimulated by natural factors such as eating, drinking, sexual activity, maternal care, but also by some substances such as alcohol, nicotine, cocaine, amphetamines. Dopamine, serotonin, opioids and GABA-ergic neurons, are primarily involved in the pleasure providing system ("Wellbeing system") (Figure 1) [8]. Any substance that interferes with GABA-ergic system may produce physical dependence. Acute habit (tahiphylaxy) occurs within minutes.

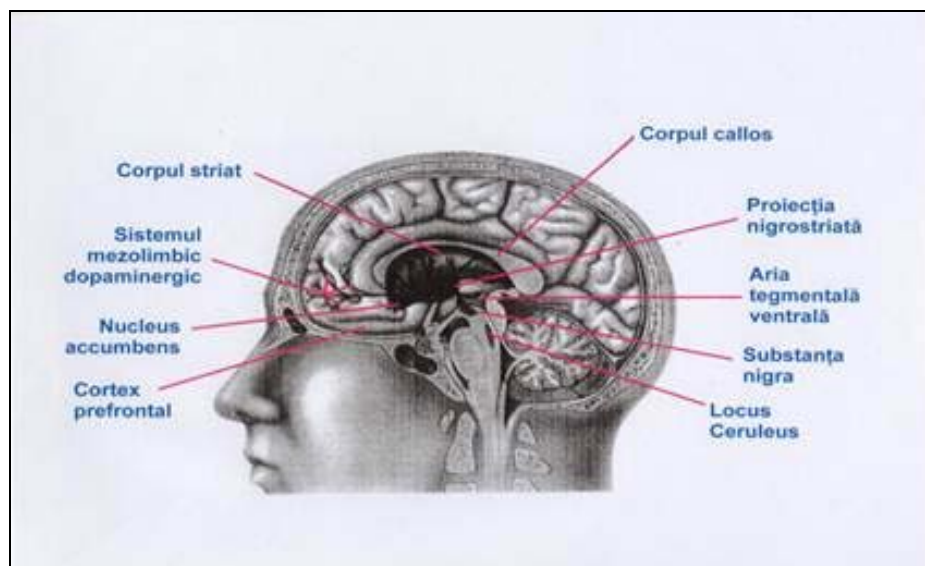


Figure 1. Reward and withdrawal center [8]

Tobacco habit persistence is due to specific nicotine dependence (drug state). This physical dependence is related to blood levels of nicotine. Thus, individual smokes to maintain a concentration above the threshold. A concentration of 50-70 ng / ml is sufficient to generate a state of dependence, which corresponds to a daily 5 mg doses of nicotine (one cigarette releases 1 mg of nicotine). Although nicotine is an "accepted" drug and considered to be less harmful, the dependence levels of nicotine products are comparable to heroin and cocaine.

Tobacco and tobacco smoke are known as human carcinogens. Tobacco smoke contains at least 4,000 chemicals, of which at least 250 are toxic or carcinogenic [3]. For example, tobacco smoke contains irritants like acetone, ammonia and toluene (found in cleaners and respectively in paint thinners), toxic heavy metals such as cadmium (used for car batteries) and arsenic (used in poison), carbon monoxide, harmful components of exhaust gases [4]. Although addictive, nicotine in tobacco is not a carcinogen [5]. All cigarettes are toxic: U.S. Health Ministry report shows that smoking cigarettes with low tar and nicotine levels do not provide health benefits [6].

OBJECTIVES

Given the increased global incidence of smoking, it is recommended the routine identification of smokers at all levels of health care in Romania and recording smoking status as a vital sign in medical documents. Studies have shown that as the smoking starts earlier, the life expectancy is lower. On the other hand, people who begin smoking at young ages have more difficulties to quit. Thus it was concluded that clinical screening of smoking increases the success rate of smoking cessation interventions (Level of evidence A).

We wanted to analyze the profile of patients who used the "Center for Smoking Cessation" Timișoara. The assessed characteristics were: smoking status, tobacco consumption, nicotine dependence score, previous attempts of smoking cessation, and personal history of pathologic diseases.

MATERIALS AND METHODS

These patients are part of a program that takes place at national level through the Ministry of Health, program called "Stop Smoking" in Timiș. The program provides counseling and treatment to those who smoke and want to quit smoking. Within

this program, patients receive medication and counseling for free. We also tried to see the incidence of comorbidities among patients that smokes.

Thus a group of 983 patients were included in the study, patients who used the "Center for Smoking Cessation" Timișoara during the period 01/01/2009 to 12/31/2009, when they completed a form with personal data.

The group was composed of 361 (36.7%) women and 622 (63.3%) men, aged between 16 and 71 years.

The assessed characteristics were: smoking status, tobacco consumption, nicotine dependence score, previous attempts of smoking cessation, and personal history of pathologic conditions (Table 1).

Table 1. Smoking status and tobacco consumption

SMOKING STATUS	CONSUMPTION OF TOBACCO
Daily	Number of packages smoked per year (number of packs smoked per day x years of smoking)
Occasionally	> 20 packs per year = big smoker
Former smokers	
Non smokers	

In order to assess the nicotine dependence score, the Fagerström questionnaire was applied (Figure 2).

FAGERSTRÖM QUESTIONNAIRE

1. When you smoke the first cigarette after awakening?

- The first 5 minutes = 3
- 6-30 minutes = 2
- 31-60 minutes = 1
- After 60 minutes = 0

2. It is difficult not to smoke in forbidden places?

Yes = 1 No = 0

3. At what cigarette you quit harder?

First = 1 point other = 0

4. How many cigarettes per day you smoke?

- 11 or less 0
- 11 to 20 1
- 21 to 30 2
- 31 or more 3

5. Smoke more often in the first hour after awakening?

Yes = 1 No = 0

6. Smoke even if you are so ill that you should stay in bed during the day?

Yes = 1 No = 0

Figure 2. Fagerström score

Nicotine dependency score is the sum of accumulated points for each question (Table 2). Thus according to the nicotine

dependence score the therapeutic approach is different (Table 3).

Table 2. Dependence on nicotine

FAGERSTRÖM SCORE	THE LEVEL OF DEPENDENCE ON NICOTINE
> 6 points	Strongly dependent
3-6 points	Higher reliance
<3 points	Low dependence

Table 3. Therapeutic attitude depending on the Fagerström score

TOTAL POINTS	INTERPRETATION
0-1	Very mild dependence , is characterized by absence of withdrawal phenomena or they are few and mild; not requiring therapy
2-3	Mild dependence , may appear difficulties in quitting smoking; drugs may be helpful.
4-5	Moderate dependence , withdrawal symptoms usual; there is real risk for diseases caused by smoking; medication is indicated
6-7	Strong dependence , with reduced possibility to quit smoking; patients have increased risk of illness; requiring medication, often in combination, for a long time
8-10	Extreme dependence , unlikely to abandon smoking; important withdrawal phenomena; require medication in high doses for long periods of time

If compared with other drugs, nicotine causes addiction as high as heroin. 95-100% of people who smoke are nicotine dependent.

RESULTS

The analysis of pathological personal antecedents found that: 58.4% (574 patients) have no other known diseases (Figure 3).

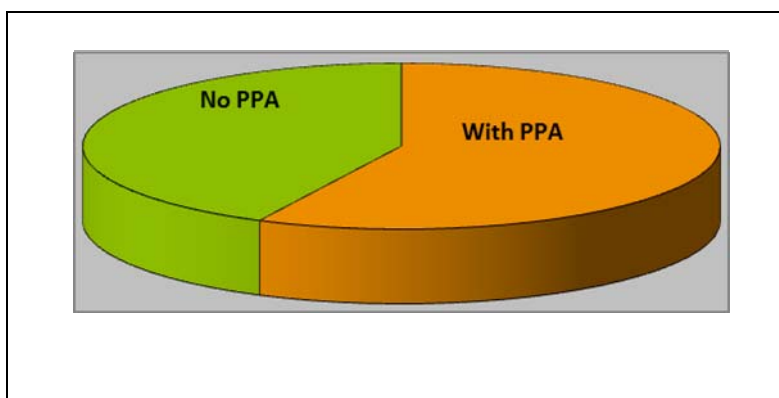


Figure 3. Distribution of pathological personal antecedents

41.6% have pathological personal antecedents: 5.9% (58) had COPD, 37 (3.8%) had asthma, 2.7% have active TB,

2.8% had a history of TB, 16.8% had cardiovascular disease, 3.1% had diabetes, 4.4% had a mental illness (Figure 4,5).

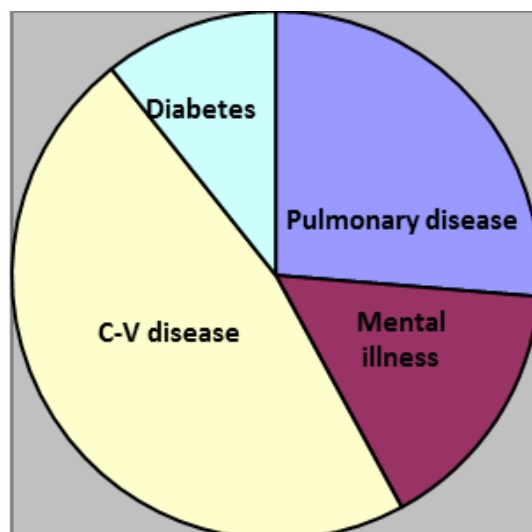


Figure 4. Distribution of the main pathology

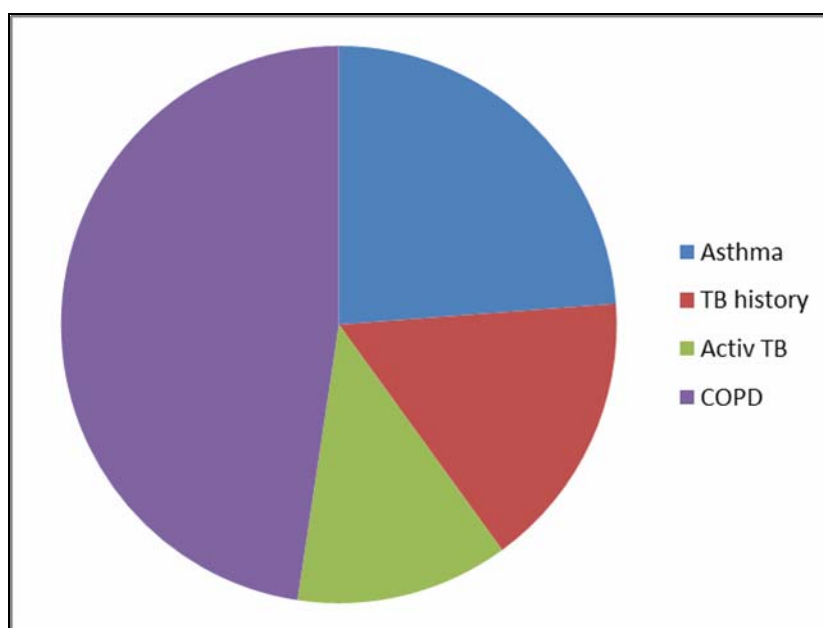


Figure 5. Distribution of the main pulmonary pathology

Analyzing the Fagerström score, the smoking status and tobacco consumption led to the following results: 62 (6.3%) patients had a minimum degree of dependence, 263 (26.8%) had an average degree of dependence and 658 (66.9%) had a high degree of dependence. On the other hand, people who begin smoking at young ages

have more difficulties to quit smoking. Studies have also shown that as earlier the smoking starts, the life expectancy is lower.

CONCLUSIONS

More than half of patients had no comorbidity. Of those with personal

pathological history cardiovascular comorbidities were major. Besides cardiovascular diseases there are others: lung disease, diabetes, mental illness. Among the pulmonary pathology, COPD is the first, followed by asthma, active TB, history of TB.

Smoking is one of the modifiable risk factors, with proven harmful effects on

health. Globally, many people are not fully aware of, misunderstand or underestimate the risks for morbidity and premature mortality due to tobacco use and exposure to tobacco smoke. Due to the high degree of dependence on nicotine and related cardiovascular risk is important to initiate actions against this habit.

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TRAFFIC- RELATED AIR POLLUTION IN THE MUNICIPALITY OF CRAIOVA, DOLJ COUNTY

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REZUMAT

Poluarea rezultată din traficul rutier reprezintă una dintre problemele cele mai urgente în zonele urbane deoarece dovezi ale efectelor negative ale poluanților aerului asupra stării de sănătate apar în mod constant. În această lucrare am studiat poluarea urbană a aerului cu dioxid de sulf (SO_2), dioxid de azot (NO_2) și cu particule ($\text{PM}_{2,5}$) rezultate din traficul rutier în perioada octombrie 2009 – martie 2010. A fost determinată dinamica orară a poluanților atmosferici în vecinătatea a două tipuri de străzi (cu trafic rutier intens și scăzut). Poluarea a fost analizată în concordanță cu traficul rutier (rata orară a circulației vehiculelor, masa fizică și continuitatea mișcării). Rezultatele arată că în primele 12 ore ale zilei evoluția concentrațiilor atmosferice ale poluanților studiați este legată de tipul de șosea, în special în cazul dioxidului de azot. În a doua parte a zilei (între orele 12 și 24) poluarea pare a fi afectată de către intervenția modulatorie a condițiilor de mediu (trendul temperaturii aerului) care reduc poluanții din atmosfera urbană.

Cuvinte cheie: mediul urban, trafic, poluarea aerului, SO_2 , NO_2 , $\text{PM}_{2,5}$

ABSTRACT

Traffic-related air pollution is one of the most pressing problems in urban areas because evidences of the adverse health effects of air pollutants are continuously emerging. In this paper we studied the urban air pollution with sulfur dioxide (SO_2), nitrogen dioxide (NO_2) and particulate matter ($\text{PM}_{2,5}$) in relation to road traffic during the period October 2009 and March 2010. The dynamics of hourly atmospheric pollutants in the vicinity of two types of street (with intense and low road traffic) was determined. The pollution has been analyzed according to the characteristics of road traffic (hourly rate of vehicles circulating, physical mass and continuity of the movement). The results show that in the first 12 hours of the day the evolution of studied atmospheric concentration of pollutants is linked to the road, especially in case of nitrogen dioxide. In the second part of the day (range 12-24 hours) the pollution appears to be marked by modulator intervention of environmental conditions (air temperature trend) that reduces the pollutants in the urban atmosphere.

Keywords: urban environment, traffic, air pollution, SO_2 , NO_2 , $\text{PM}_{2,5}$

INTRODUCTION

Atmospheric pollution, related to various human activities, is one of the most important public health issues in the urban life environment. As the limit values for air quality, which were set forth so as to protect public health, have come to be frequently exceeded, especially in such areas with intense road traffic, interventions in order to limit the pollution and improve the quality of the atmosphere are imperative [1-6]. The purpose of the present study is to evaluate the level of pollution with sulfur dioxide (SO₂), nitrogen dioxide (NO₂), and particulate matter (PM₁₀) of the air in the Craiova municipality, Dolj County, for implementation the Council Directives (96/61/EC, 96/62/EC and 199/30/EC) regarding the evaluation and management of the environment air quality [7-9].

MATERIAL AND METHOD

The data regarding Craiova municipality air pollution were taken from the Environmental Hygiene Laboratory of Public Health Department and the Dolj County Environment Protection Agency. The hourly concentrations have been compared to the limit values averaged over 24 hours for SO₂ (125 µg/m³) and over a calendar year for NO₂ (40 µg/m³) and PM₁₀ (40 µg/m³). The dynamics of pollutants has been analyzed according to the characteristics of road traffic (hourly rate of vehicles circulating, physical mass and continuity of the movement).

RESULTS AND DISCUSSIONS

Analysis of urban air pollution with SO₂ in an area with heavy traffic show that the highest concentrations of sulfur dioxide are found in 9-14 time slot, but the values do not exceed the legal standards for protecting human health. One aspect should be noted: that determinations were made in a relatively warm period, when the minimum temperature has not fallen below 10°C (Figure 1). Atmospheric concentration determined in a central area of small-scale traffic of the city is lower than in high traffic area, but the fluctuations are more frequent schedules and do not reach dangerous levels for health (Figure 3).

Differences in hourly evolution of the pollutant sulfur dioxide observed in the two areas investigated can be explained by the fact that the central area of the city share of this pollutant pollution sources (fuel combustion, industrial processes or the emissions from diesel engines) is reduced.

In the areas with intense road traffic, maximum values of the pollutant sulfur dioxide are found especially in rush hour periods. This aspect may be correlated with the large number of vehicles, especially heavy vehicles, that come through the area and whose emissions are additional sources of urban air pollution (Figure 2).

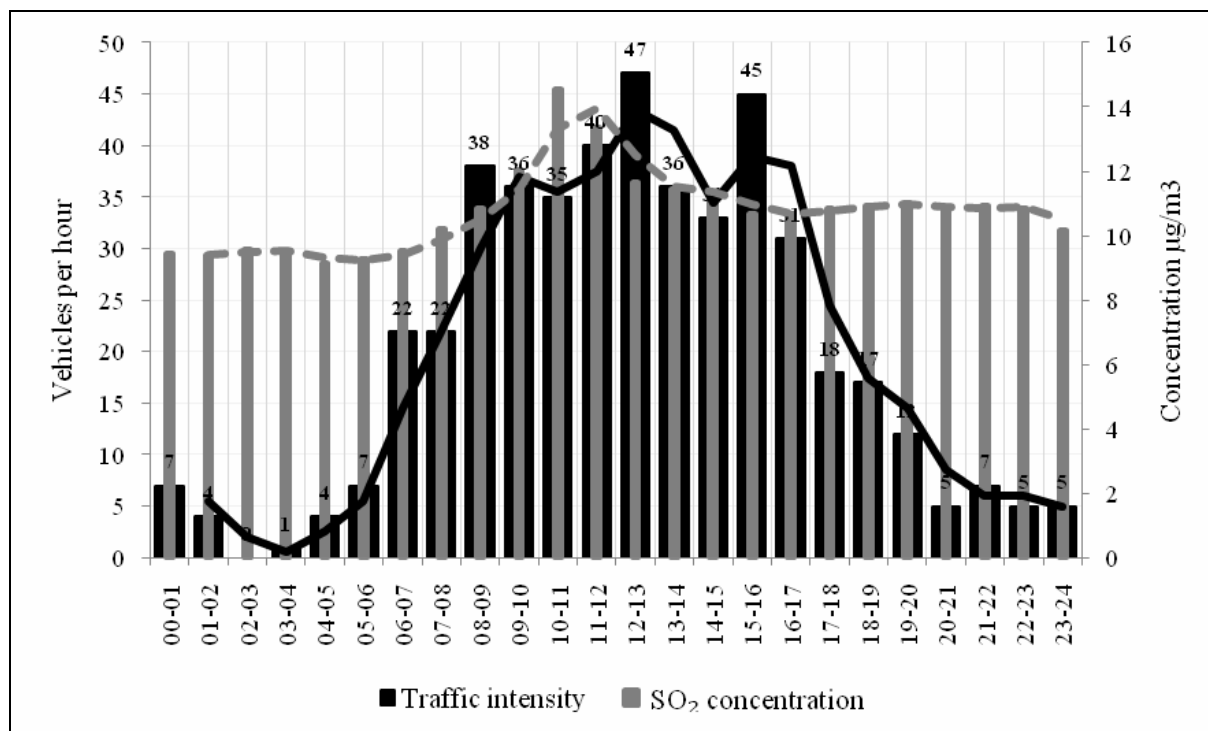


Figure 1. Hourly dynamics of SO₂ pollution - heavy traffic $\geq 3T$

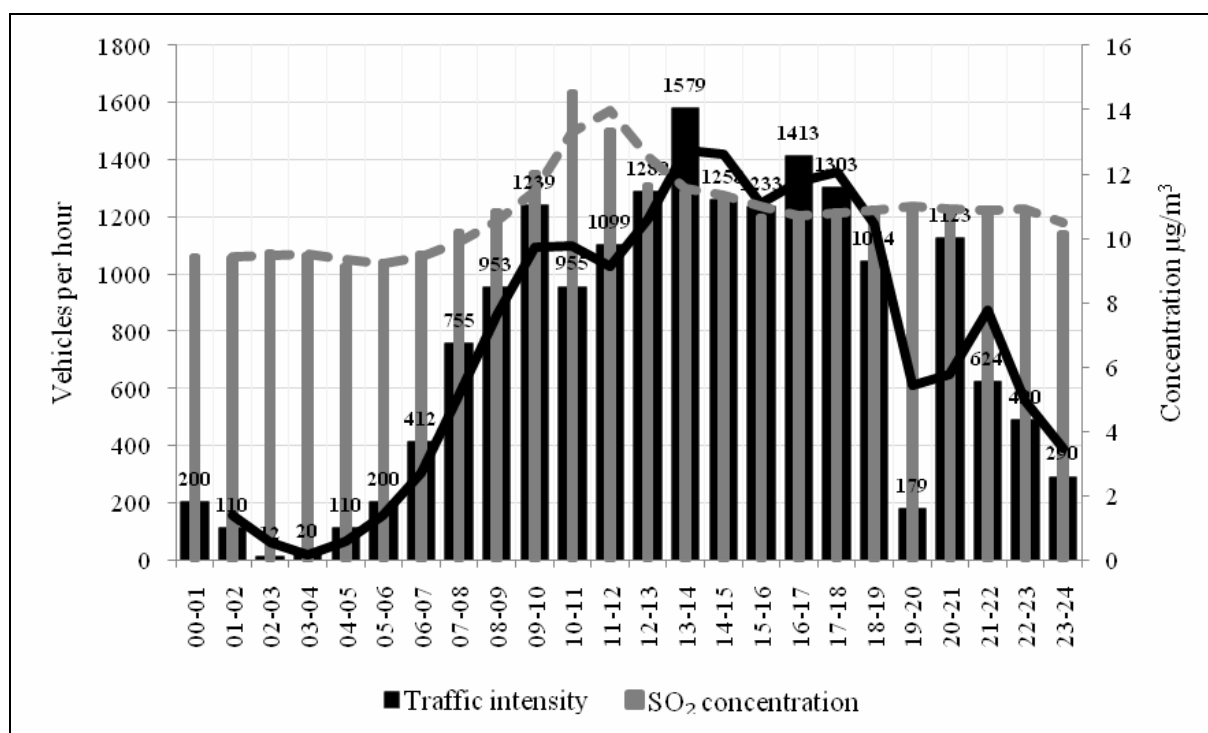


Figure 2. Hourly dynamics of SO₂ pollution - heavy traffic

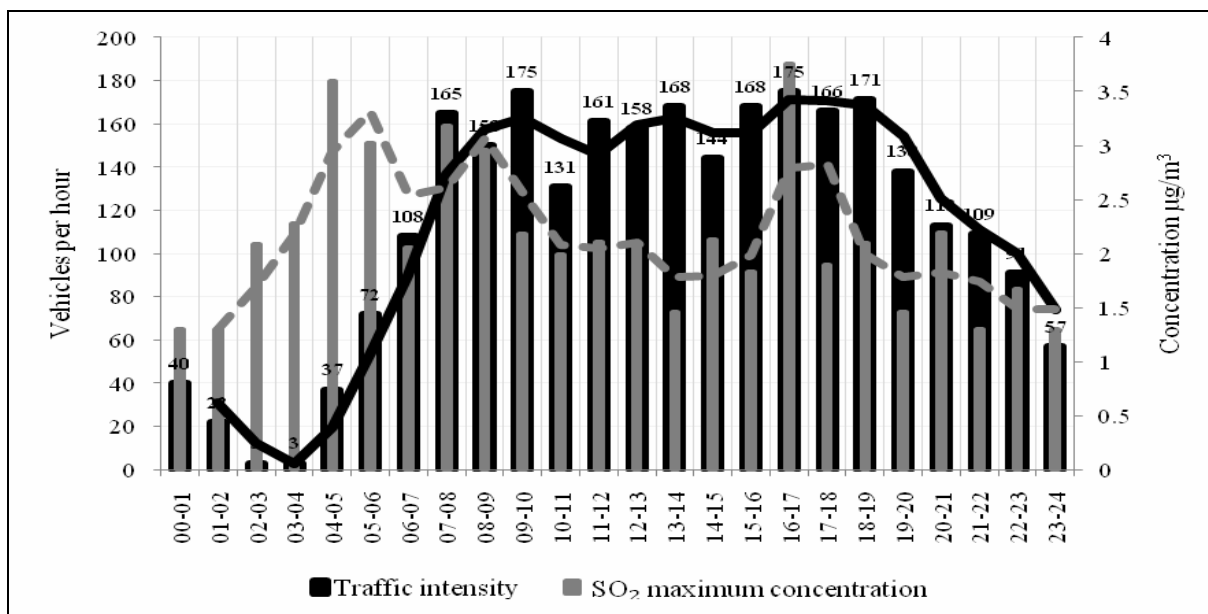


Figure 3. Hourly dynamics of SO₂ pollution - low traffic

Circadian trend appearance of pollutant sulfur dioxide in relation to traffic intensity does not allow us to establish correlations between emissions of internal combustion engines and urban background pollution.

The analysis of the hourly dynamics of the municipality's air pollution with nitrogen

dioxide show a correlation of these concentrations and the dynamic of traffic intensity (Figure 4), so that the background pattern pollution allows a possible association with the magnitude of motor vehicles circulation.

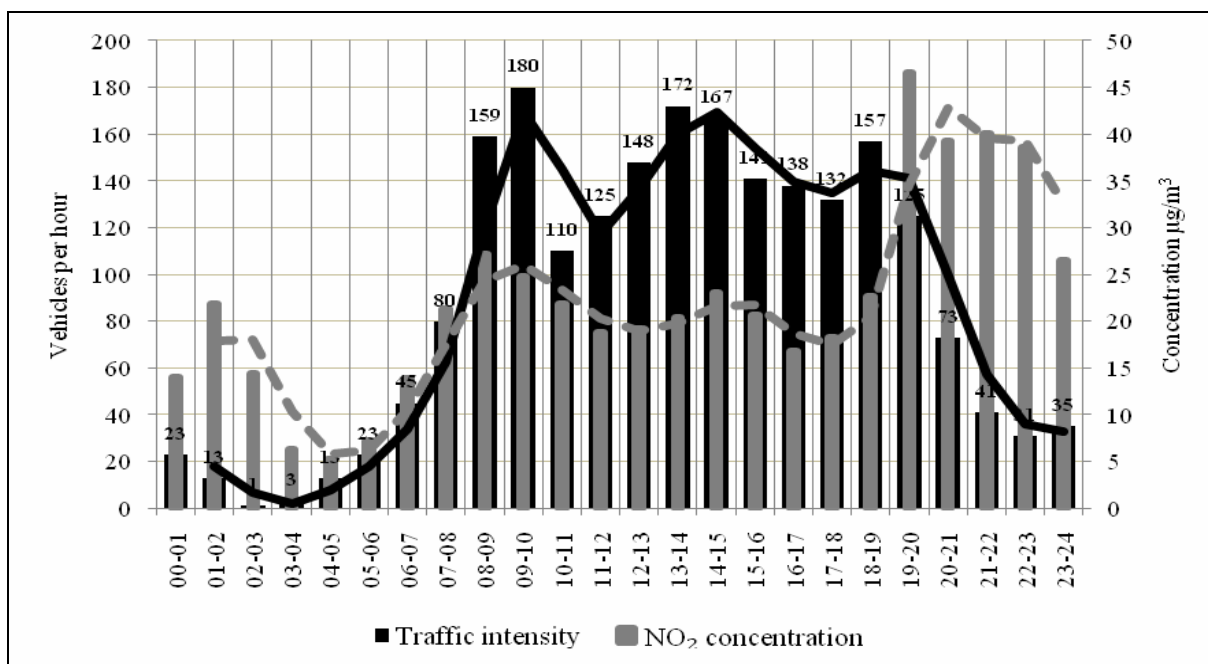


Figure 4. Hourly dynamics of NO₂ pollution - heavy traffic ≤ 3T

The aspect of the background pollution pattern with nitrogen dioxide suggests a possible relationship with traffic intensity. However, the values of the urban air pollutant are not exceeding the limit value for human health protection. The moments when atmospheric levels of nitrogen dioxide exceed the maximum permissible concentration during the night are comprised in the interval from 23-02, when road traffic has minimum values.

This apparently paradoxical dissociation between the dynamics of the level of pollution/traffic flow may be explained by the fact that during the night, due to thermal gradient between the ground surface and the atmosphere, air self-purification mechanisms are less efficient.

A similar evolutionary trend is found for the relationship between background air pollution-heavy motor vehicles circulation (Figure 5).

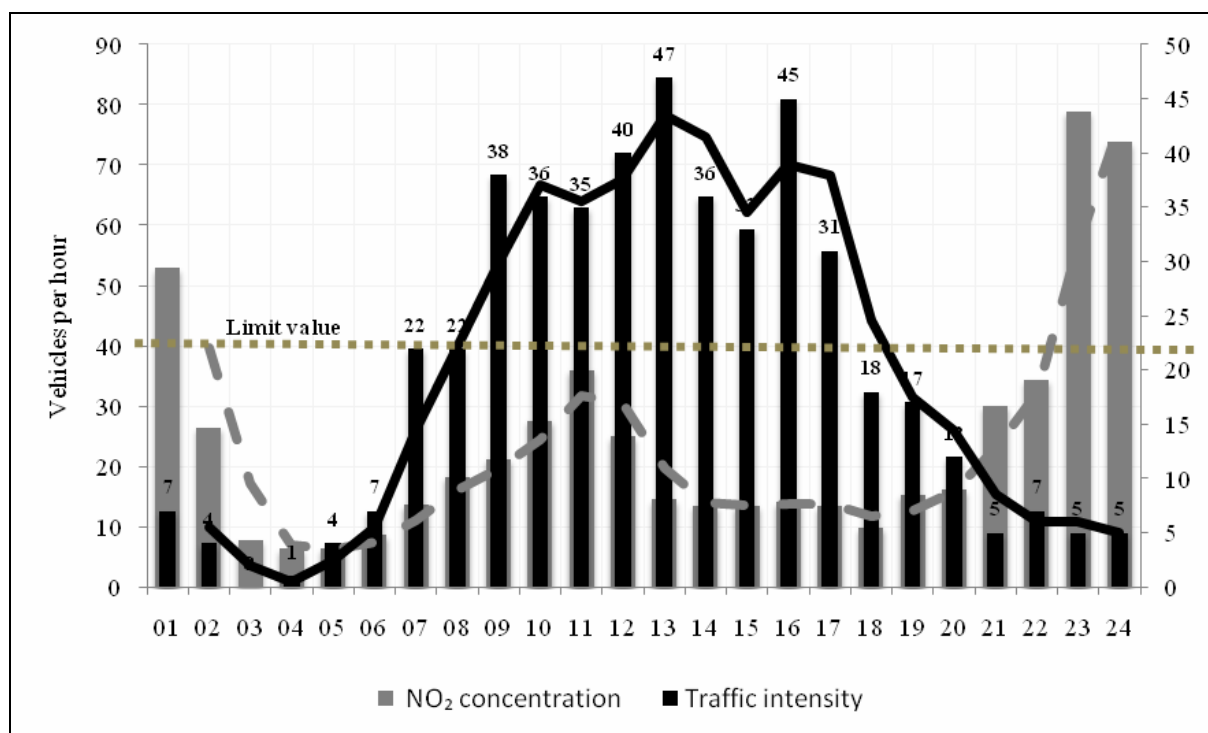


Figure 5. Hourly dynamics of NO₂ pollution - heavy traffic $\geq 3T$

When analyzing the relationship between background air pollution with particulate matter and over 3T heavy motor vehicles

circulation, it is noted a trend similar to the one observed for NO₂ (Figure 6).

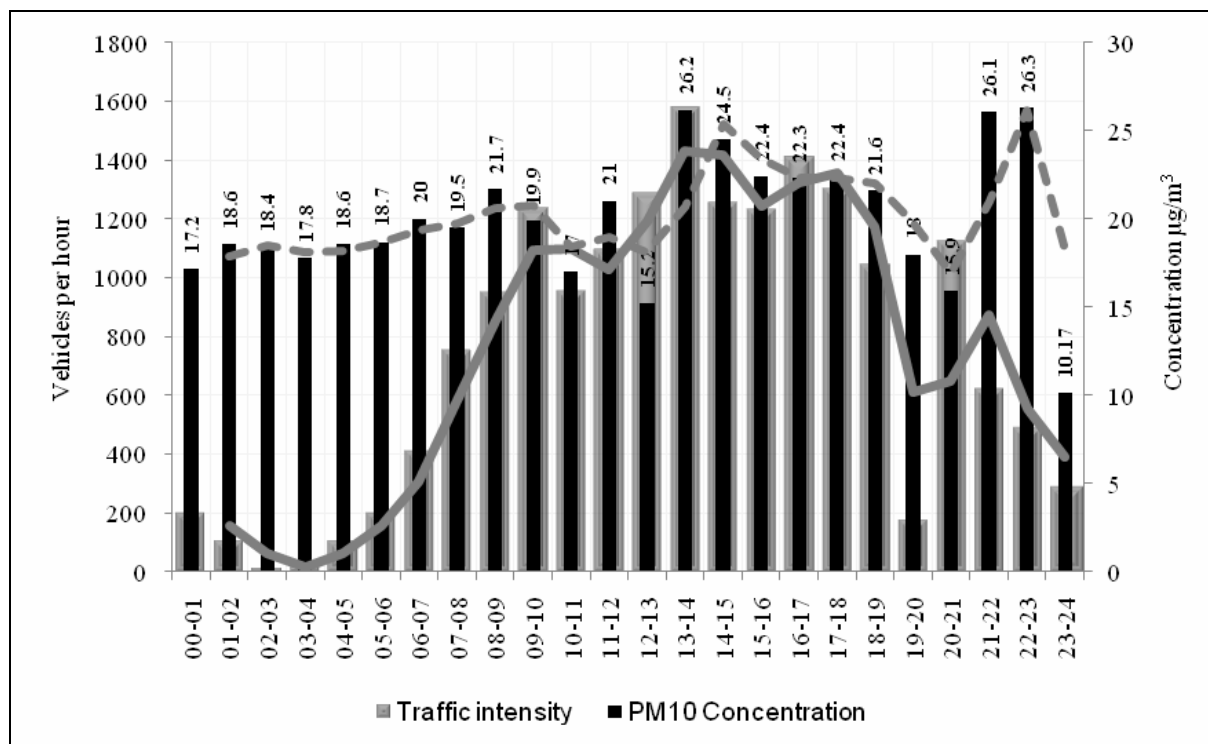


Figure 6. Hourly dynamics of PM₁₀ pollution - heavy traffic $\geq 3T$

These aspects suggest that motor vehicles do not significantly influence the particles pollution of the municipality's air. These data correlate with those from literature [10-

12], accounting as major sources of urban air pollution with sulfur dioxide and particles the coal combustion processes and much less the diesel emissions (Figure 7).

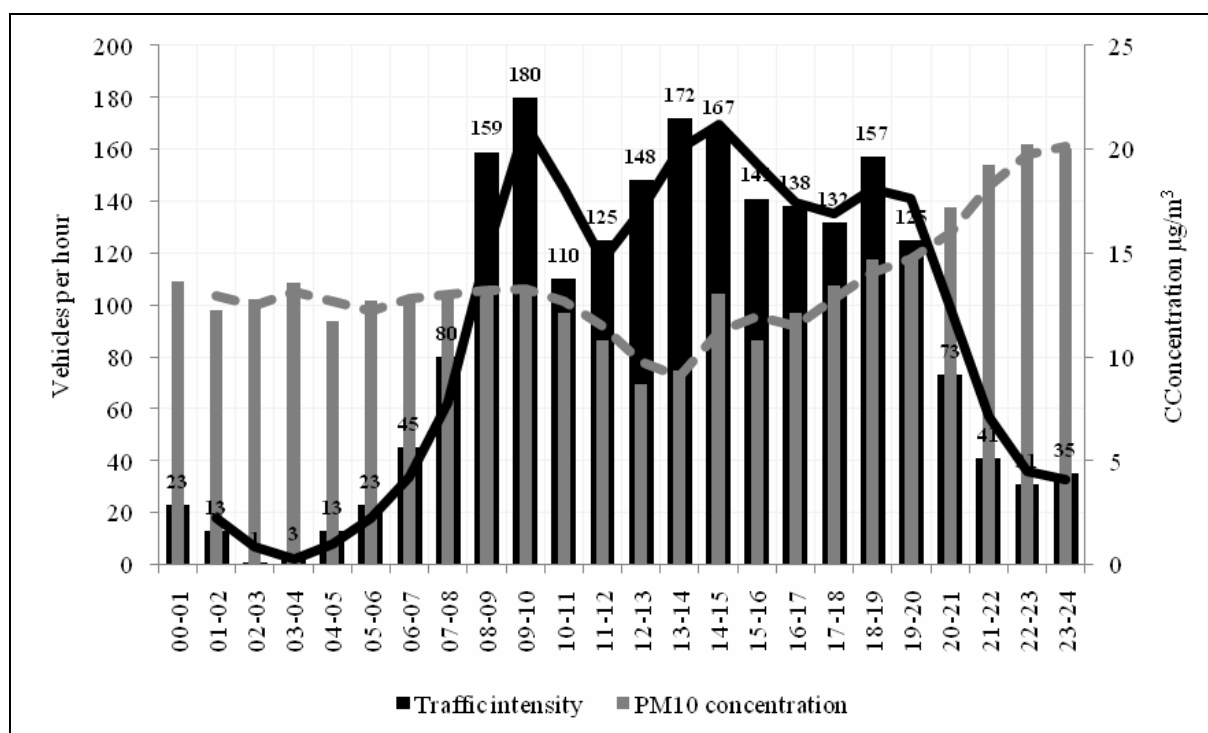


Figure 7. Hourly dynamics of PM₁₀ pollution - low traffic – lightweight cars

CONCLUSIONS

1. The results of the present study show that urban air background pollution with sulfur dioxide is related to the traffic's intensity and to the category/tonnage of the circulating vehicles.
2. The relationship between road traffic-air pollution with nitrogen dioxide and

particulate matter and sediments is less obvious.

3. The data obtained show that in the afternoon, namely in the time interval between 12 and 24, the urban air pollution seems to be influenced by interference modulators of ambient weather conditions (especially temperature) resulting in reduced pollutant concentration.

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THE RELATIONSHIP BETWEEN CONSUMPTION OF NITRATE CONTAINING WATER AND THE HEALTH STATUS OF THE POPULATION IN THE TOWN OF DETA, TIMIS COUNTY

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REZUMAT

Introducere. Studiul a avut drept scop identificarea unor factori de risc din apa potabilă distribuită în mediul urban – localitatea Deta din județul Timiș, din diferite surse (instalațiile centrale de aprovizionare cu apă potabilă și sursele locale - foraje publice și private) și relaționarea cu starea de sănătate a populației. **Metodologie.** Baza de date privind concentrația nitraților în apa potabilă/sursă/localitate din perioada 1993-2007 a fost prelucrată și reprezentată pe hartă (programul Quantum Gis 8 și Epi Info) și s-a stabilit legătura cu morbiditatea acută (methemoglobinemia acută) și cronică (numărul de cazuri noi de îmbolnăvire pentru perioada 2003-2007 - tumori maligne gastro-intestinale și esofagiene, limfom non-Hodkin, tumori maligne ale sistemului nervos, tumori renale) și numărul de avorturi spontane și de malformații congenitale. **Rezultate și discuții.** Consumul apei cu o concentrație foarte mare de nitrați, mai ales în perioada 1993-2000 (valori obținute pentru forajele private de 250-130 mg/l), ceea ce confirmă o contaminare veche, persistentă cu nitrați explică expunerea populației timp îndelungat la valori crescute de nitrați. De asemenea apa distribuită prin sistemul centralizat a avut constant valori ale nitraților peste CMA, cuprinse între 50 și 70 mg/l. Expunerea gravidelor la o concentrație crescută de nitrați în apa potabilă a fost o posibilă cauză în apariția avorturilor spontane (în anul 2004 atingându-se valorile medii cele mai mari de 106,85 cazuri noi la 100 000 locuitori) precum și apariția malformațiilor congenitale la nou-născuți (valorile medii cele mai mari au fost înregistrate în anul 2003 de 66,14 cazuri noi la 100 000 locuitori). **Concluzii.** Diferența între mediile concentrației nitraților/sursă poate fi explicată de tipul sursei de aprovizionare cu apă și diferite adâncimi de extracție a apei: cele mai mari valori s-au observat în cazul forajelor private (sursa – apa freatică). Instituțiile responsabile trebuie să realizeze managementul surselor de apă: controlul exploatarei solului, respectarea legislației, respectarea măsurilor privind construcțiile în sectorul aprovizionării cu apă potabilă,

supravegherea și menținerea calității apei conform legislației, educația populației, reducând valorile nitratilor din sistemul centralizat sub valoarea CMA și să crească numărul populației care să se aprovizioneze din sistemul centralizat, iar apa distribuită în acest mod să fie monitorizată permanent de organele competente.

Cuvinte cheie: nitriți, apă potabilă, stare de sănătate

ABSTRACT

Introduction. The aim of the present study was to identify some of the risk factors in the drinking water distributed in the urban area – the town of Deta in Timis County, from different sources (central installations for drinking water supply and local sources – public and private wells) and to establish a relation to the population's state of health. **Methodology.** The data base regarding the nitrates concentration in drinking water/source/locality, from the 1993-2007 period, was processed and represented on the map (Quantum Gis 8 program and EpiInfo program) and a connection was made to acute morbidity (acute methemoglobinemia) and chronic morbidity (the number of new cases of malignant gastro-intestinal and esophageal tumors, non – Hodgkin lymphoma, malignant nervous system and renal tumors) and the number of miscarriages and congenital malformations. **Results and discussions:** The use of water with very high nitrates concentration, especially in the 1993-2000 period (the values for private wells were 250-130 mg/l), confirming an old, persistent nitrates contamination, explains the population's exposure for a long time to high values of nitrates. The water distributed through the centralized supply system was also constantly exceeding the maximum allowed concentration, ranging between 50 and 70 mg/l. The exposure of pregnant women to high nitrates concentration in drinking water was a possible cause for the miscarriages (in the year 2004 the highest medium values were recorded: 106.85 new cases in 100 000 people) as well as for congenital malformations in new-born children (the highest medium values were recorded in the year 2003: 66.14 new cases in 100 000 people). **Conclusions.** The difference between the medium values of nitrates concentration/source may be explain by the type of the water supply and by the different extraction depths: the highest values were observed in the case of private wells (source – water table). The responsible institutions have to achieve the management of water sources: to control the soil exploitation, to abide the legislation, to comply to measures regarding buildings in the drinking water supply sector, to overlook and maintain the water quality according to the legislation, to educate the population, to reduce the values of the nitrates in the centralized system under the maximum allowed concentration and to raise the number of people which get water from the centralized system, and the water distributed this way to be permanently monitored by the responsible institutions.

Keywords: nitrates, drinking water, health status

INTRODUCTION

The aim of the present study was to identify some of the risk factors in the drinking water distributed in the urban area – the town of Deta in Timis County, from different sources (central installations for drinking water supply and local sources – public and private wells) and to establish a relation to the population's state of health.

The town of Deta represents an administrative, economical and cultural center in the west part of Romania, situated between Timisoara and the Serbian border, at 44 km from Timisoara and 118 km from Belgrade. In the administrative area of Deta town there is also the village of Opatita, situated at 3.5 km from the town. Data from the last census in the year 2002 show the population of the town of Deta to be 6 418

people, of which 69.49% are of Romanian nationality, 16.44% are Hungarians, 5.54% are Germans, 4.34% are Serbians, 3.44% are gypsies and 0.75% other nationalities.

The Public Service of Town Management carries on activities of abstraction, treatment and distribution of drinking water and activities of sewerages and treatment of used waters. The sources of drinking water are public wells of great depth and private wells. The distribution of drinking water is local or centralized (provided by the "AQUATIM" company from Timisoara since the year 2007). The company uses modern equipment for interventions. During the year 2008 investments were made for the upgrading of filtering, replacement of old pipelines from the water supplying network [1].

Nitrates are inorganic compounds characterized by high water solubility. Major nitrates sources in drinking water are represented by fertilizers used in agriculture and animal fertilizers from the animal farms. The shallow wells are the most susceptible to nitrates contamination. Food is the major source of exposure to nitrates [1-4].

Nitrates represent a health risk because their conversion to nitrites. Once ingested, the conversion of nitrates to nitrites takes place in the saliva in population groups of all ages and in the gastrointestinal tube for infants. High enough concentration of nitrates in drinking water may determine methemoglobinemia in infants, also called "the blue infants disease" [5-6].

The categories with high intoxication risk for nitrites are: young children under 6 months of age, pregnant women after the 30th week of pregnancy, individuals with low gastric acidity, individuals with hereditary methemoglobin-reductase deficit [1,2].

After the conversion of nitrates into nitrites in the human body, they may react with

certain substances containing amines found in the foods and results nitrosamines, known as potentially cancerigenic substance. The formation of nitrosamines is inhibited by the antioxidants present in the foods, as vitamin C and vitamin E [7-10].

The endogenous formation of nitroderivates was demonstrated in humans related to drinking water containing nitrates exceeding the permitted limit (50 mg/l according to the European Directive 98/83/EC transposed in the Law regarding drinking water 458/2002 and 10 mg/l according to the United States Environmental Protection Agency – U.S. EPA) [1,11-16].

The recommendations of the WHO regarding the risk of exposure to intermediary values of nitrates 5 – 10 mg/l are to assess and demonstrate this risk in trough epidemiological studies and to clarify the role of nitrates in drinking water up against the nitrates in foods [9,22].

METHODOLOGY

During the 1993 – 2007 period nitrates, nitrites, ammonia, and oxidability were determined in the drinking water collected at the consumer, supplied by both the centralized distribution system and by public or private wells in the urban area of Deta town, Timis County.

The data base provided by the Public Health Authority from Timis County was processed in Excel, resulting medium and maximum values for each sampling point and for every location/year, on water sources: centralized distribution system, public and private wells. Then a media for medium annually values in the studied period of time was calculated and was graphically represented.

According to WHO recommendations the aim of this study was to highlight the water sources with nitrates concentration exceeding the maximum allowed value and those with values of nitrates concentration between 5 and 50 mg/l, in order to observe

the relationship between the consumption of water with nitrates and the formation of nitroderivates.

Data of acute morbidity (acute methemoglobinemia) and chronic morbidity (the number of new cases during the 2003 – 2007 period for malignant gastro-intestinal and esophageal tumors, non Hodgkin lymphoma, malignant tumors of the nervous system, renal tumors) and of the number of miscarriages and congenital malformations were provided by the Public Health Authority of Timis County. The data base was completed with data from the surgery in the town of Deta and these were correlated with the medium values of the indices of interest/sampling point.

The following were represented in a graphic form:

- The evolution of organic compounds contamination indices (nitrates, nitrites, ammonia and oxidability) for the drinking water in the town of Deta, in the 1993-2007 period, on water sources types
- The specific morbidity for each cause was calculated – the specific incidence index (the frequency of new cases for a certain disease in a territory and a period of time) according the formula:

specific morbidity for each cause = $X * 100000 /$
 number of people exposed to the risk factor (for
 every year – during the 2003 – 2007 period)
 X = the number of new cases

- The incidence of diseases related to the consumption of water with high nitrates concentration, on age groups and types of diseases, during the 2003 – 2007 period
- The incidence of congenital malformations in children/year, whose mothers consumed water with high nitrates concentration from different sources.

RESULTS AND DISCUSSIONS

For all three types of sources of drinking water in Deta a decreasing trend was observed for the medium nitrates concentration, during the 1993 – 2007 period, from 84.9 mg/l to 36.92 mg/l and a slow decreasing trend for the evolution of other indices: nitrites, ammonia and organic substances (Figure 1-4).

The values exceeding the limit value for organic substances (oxidability), ammonia, nitrates and nitrites, denote the existence of contamination with organic substances of the drinking water source.

Nitrates, reflecting an old pollution (weeks or months), registered a peak in the year 1993 and a minimum in the year 2003 [17-19].

Ammonia, which is a recent organic substances pollution indicator and an indicator of a primary purification stage, registered a slow decreasing trend from 4.12 mg/l in 1993 to 0.1 mg/l in 2007, without registering in any year the value 0 mg/l, representing the admitted limit for water from the water table.

Nitrites, which are relatively recent pollution with organic substances indicators, and also indicators of a more advanced stage of self – purification, registered a peak in the year 1995, 0.7 mg/l, in the rest of the studied period of time their value was 0 mg/l, which is the admitted limit for drinking water.

The sudden rise of the organic substances value is an indicator of pollution, due to getting into the water of human and/or animal residue. In the present case, the organic substances registered a slow decreasing trend starting in 1993 from 8.84 mg O₂/l to 2.15 mg O₂/l in 2007, and starting from 2003 they do not exceed the admitted limit (organic substances 5 mg O₂/l).

Thereby, in the present, the nitrates exceed the admitted limit, indicating old nitrates pollution in both the public wells and the centralized distribution system.

For the public wells with subterranean water at more than 50–60 m depth, in lack of microbiological contamination, the presence of excess ammonia in the water may be due to transfer from soil naturally containing this substance.

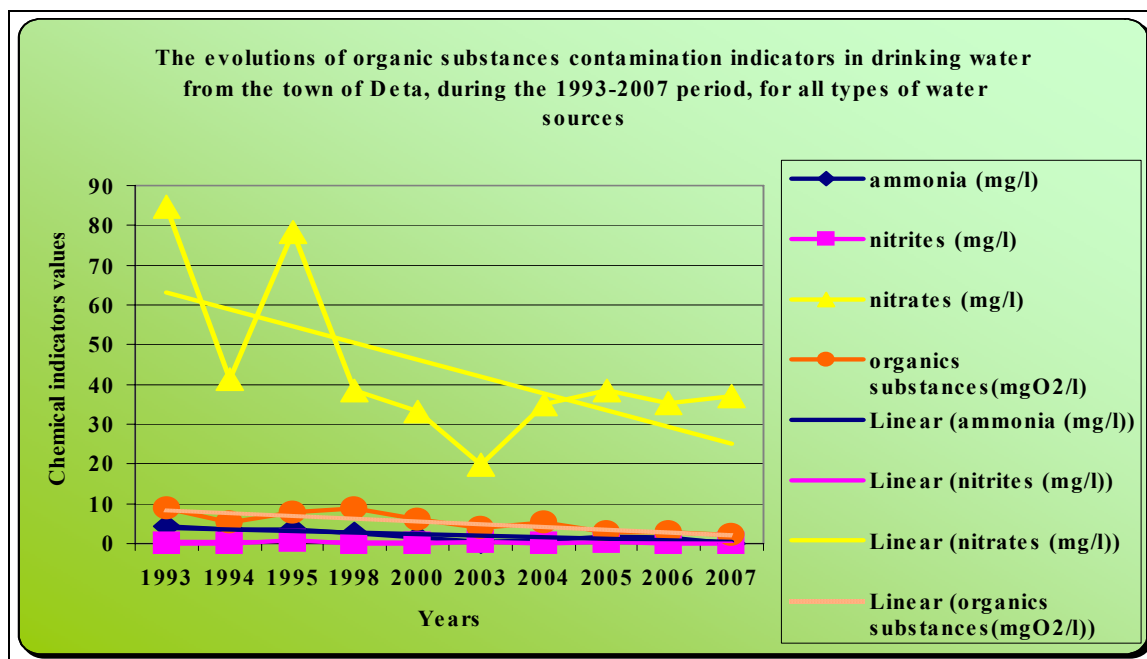


Figure 1. The evolution of organic substances contamination indicators in drinking water from the town of Deta, during the 1993–2007 period, for all types of water sources

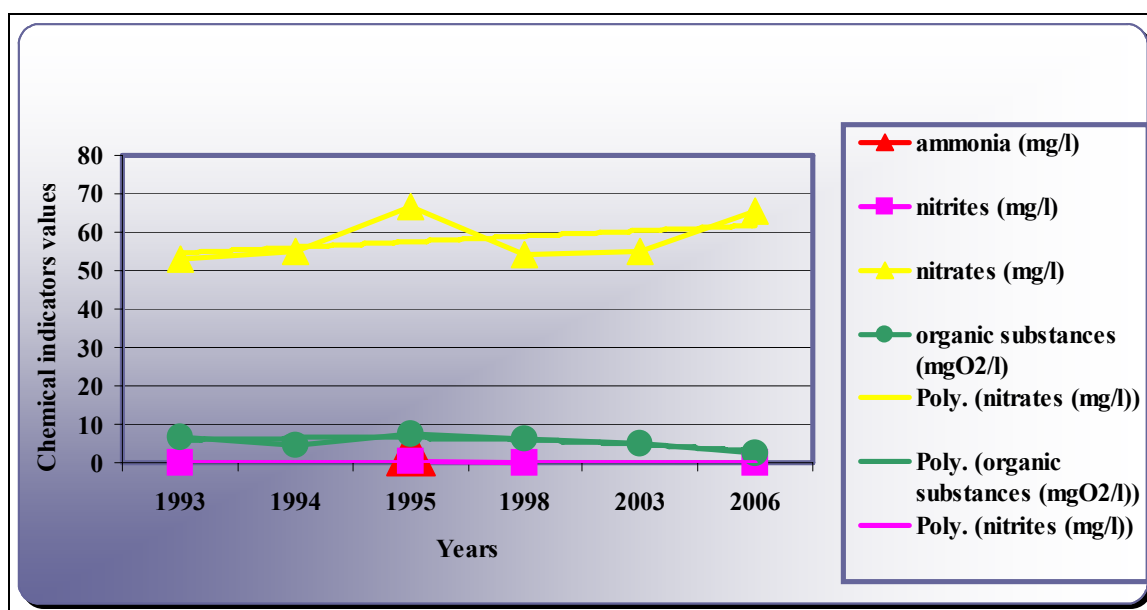


Figure 2. The evolution of organic substances contamination indicators in drinking water provided by water plants from the town of Deta (nitrates > 50 mg/l), during the 1993–2007 period

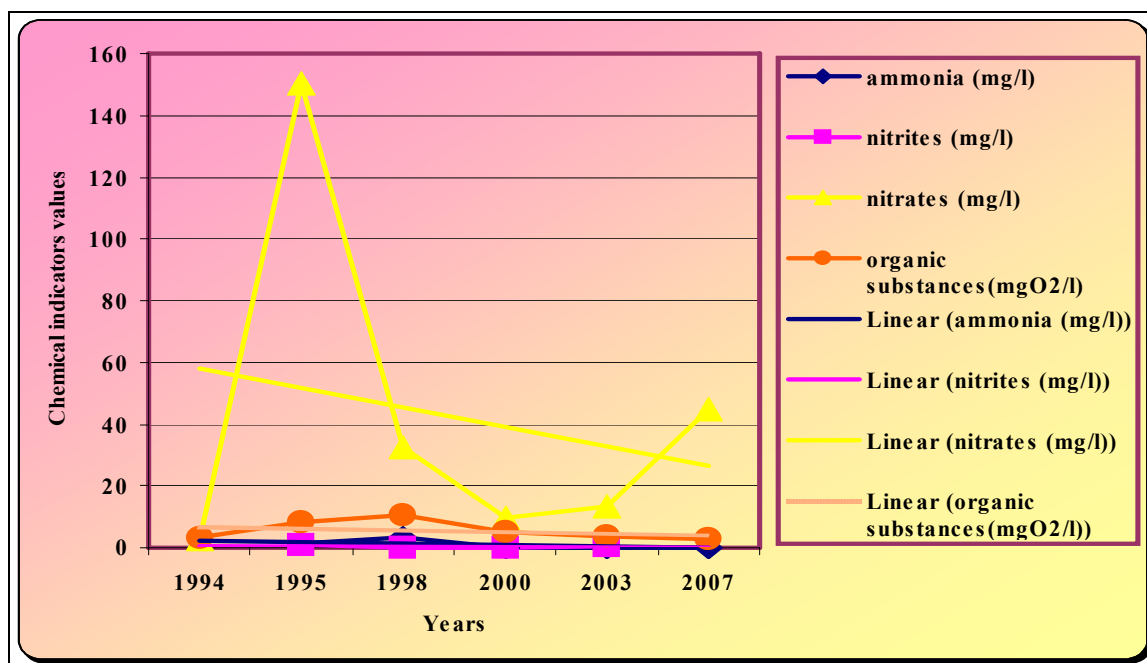


Figure 3. The evolution of organic substances contamination indicators in drinking water provided by public wells from the town of Deta, during the 1993–2007 period

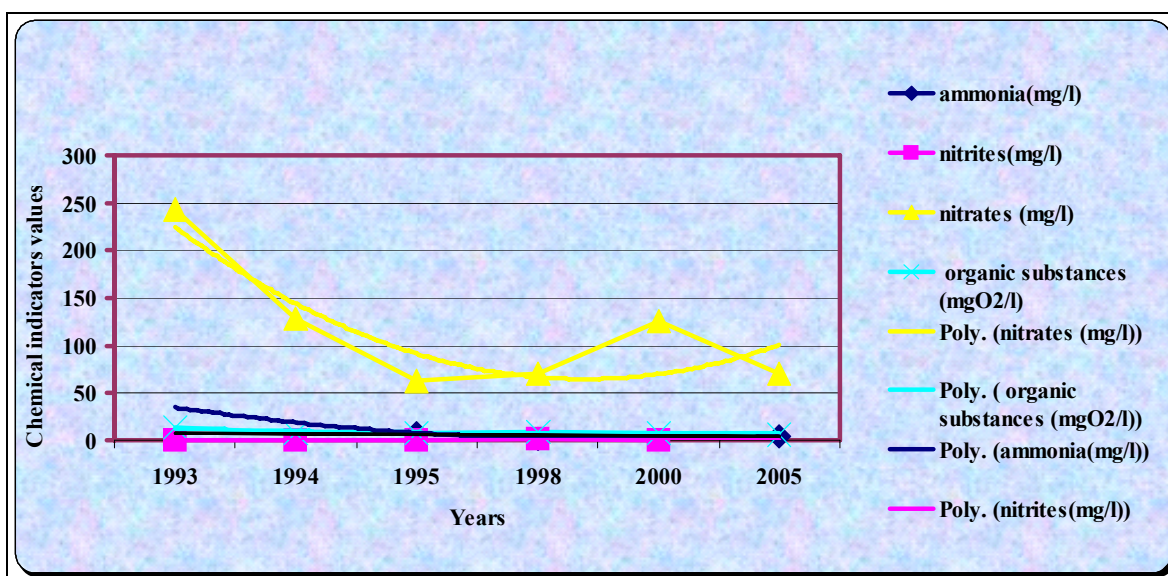


Figure 4. The evolution of organic substances contamination indicators in drinking water provided by private wells from the town of Deta (nitrates > 50 mg/l), during the 1993–2007 period

In the water from public wells the nitrates registered a decreasing trend during the year 1993, in the year 2007 reaching a value under the MAL (maximal admitted limit). The values of organic substances, ammonia and nitrites presented a slow decrease in the studied time period. In the centralized

distribution system the values for nitrates rose from 52.92 mg/l in 1993, to 66.67 mg/l in 1995, and in the year 2006 the values were once more higher (65.5 mg/l). The organic substances registered a slow decrease, from the values in 1995, 7.37 mg O₂/l, down to 2.65 mg O₂/l in 2006. The

values of nitrites also registered a decrease from 1995 (0.245 mg/l) until 2006 (0.066 mg/l). the values of nitrates from private wells constantly decreased from 1993 (243 mg/l) until 2005 (70 mg/l). The maximum values for organic substances were

registered in 1993 (14.32 mgO₂/l) and the minimum values were registered in 2005 (5.93 mgO₂/l). The nitrites had maximum values in 1998 (1.07 mg/l). The values of ammonia in 1995 were 8 mg/l, and in the year 2005 reached 5 mg/l (Figure 5).

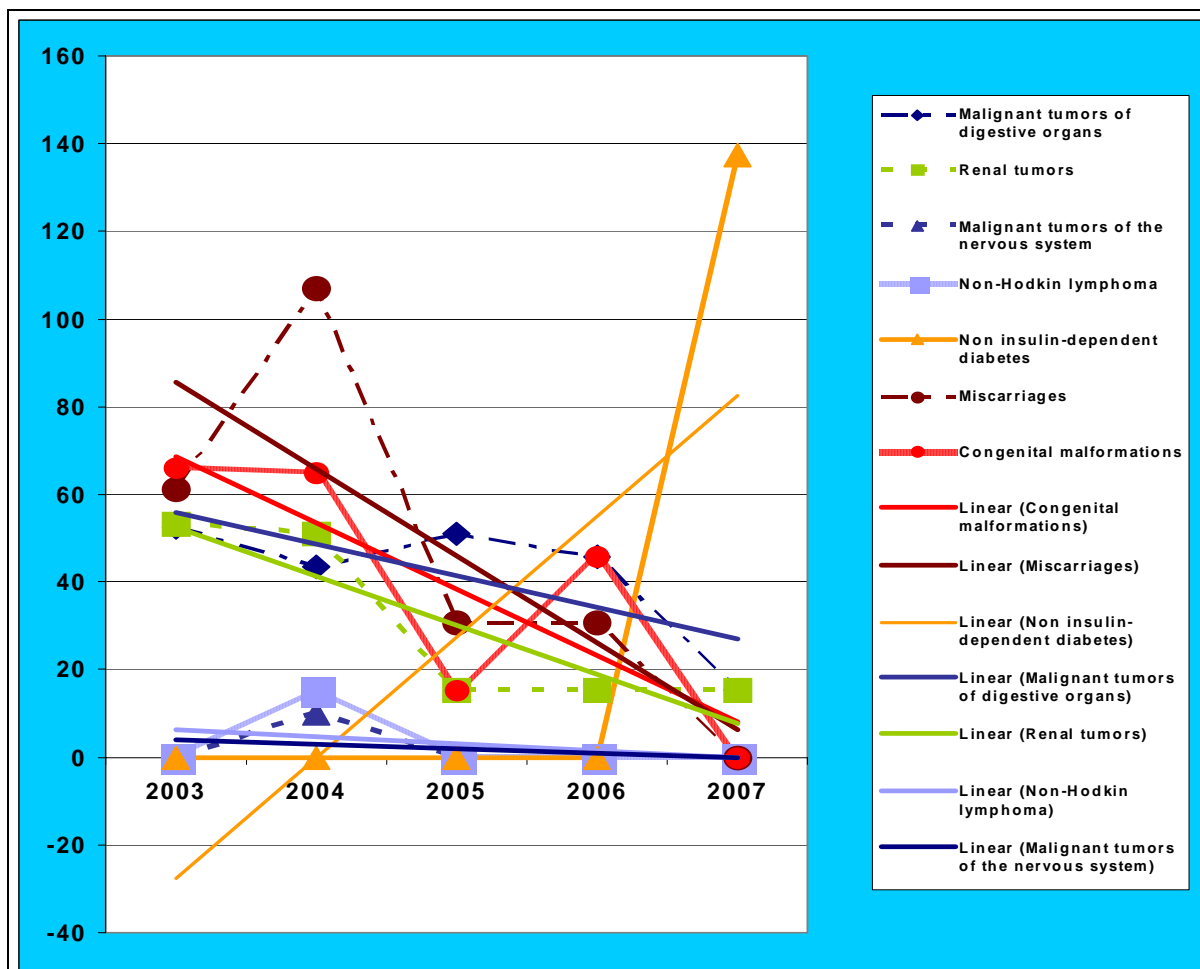


Figure 5. The evolution of the incidence of diseases related to the high nitrates concentration in drinking water, from the town of Deta, during the 2003–2007

During the 2003–2007 period of time, the incidence of miscarriages presented a maximum value in the year 2004 (106.85 new cases in 100 000 people), registering a decreasing trend until 2007. In return, the incidence of congenital malformations in new-born babies from mothers exposed to nitrates containing water registered an increasing trend reaching a peak in the year 2007 of 45.79 new cases in 100 000 people. During the studied period of time there were

no cases of acute methemoglobinemia reported.

The incidence for chronic conditions as:

- malignant tumors of: digestive organs (lips, oral cavity, pharynx, esophagus, stomach, colon, rectum and malignant anal tumors, liver and biliar tract), renal organs (kidney and bladder), nervous system registered decreasing trends, but the registered values were still high for malignant

tumors of the digestive tube, 15.2 new cases in 100 000 people in the year 2007;

- the non-Hodkin lymphoma registered values of 15.26 new cases in 100 000 people in the year 2004;

- diabetes registered a peak in the year 2006, 137.28 new cases in 100 000 people.

The incidence of diseases related to the type of condition and age groups is represented in the Figures 6–9.

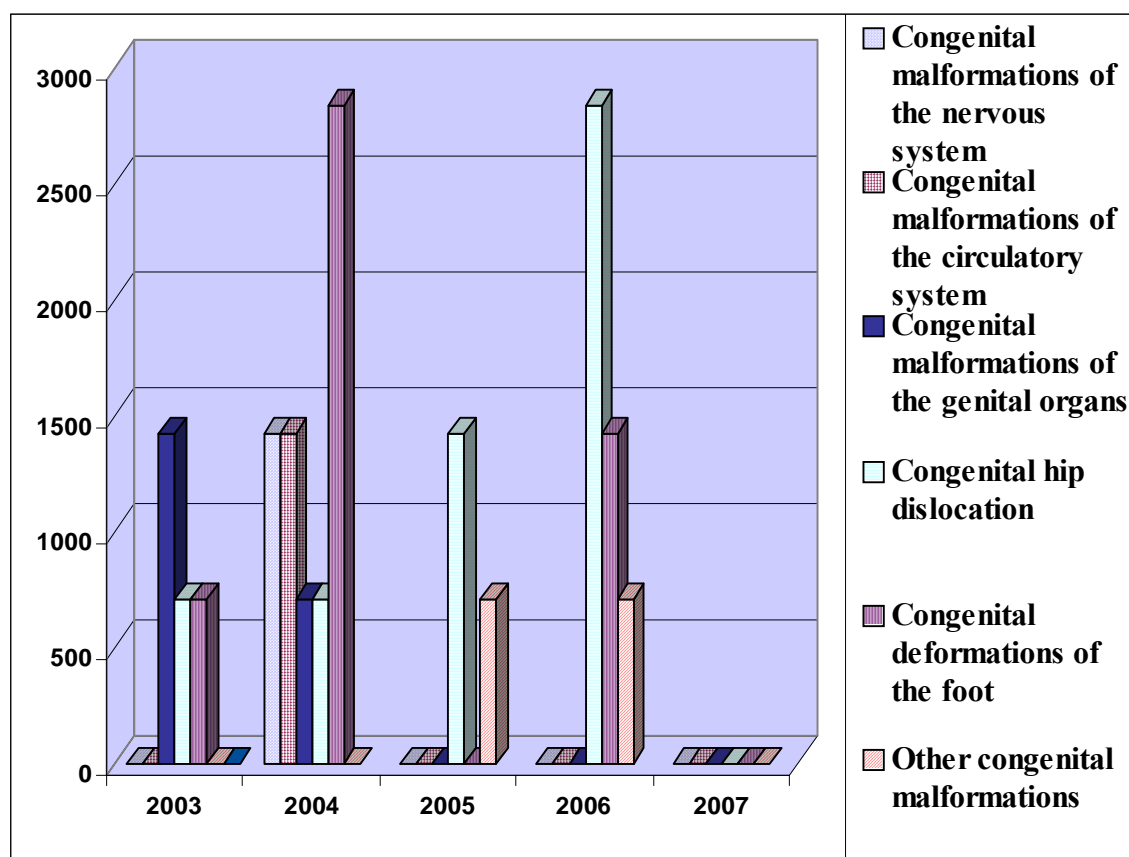


Figure 6. Incidence of conditions related to the high nitrates concentration in drinking water from the town of Deta, at the age group under one year of age, during the 2003–2007 period

For the age group under one year, the highest incidence was registered in the year 2004 for congenital deformations of the foot (2836.87 new cases in 100 000 people) and

in the year 2006 for congenital hip dislocation (2836.87 new cases in 100 000 people).

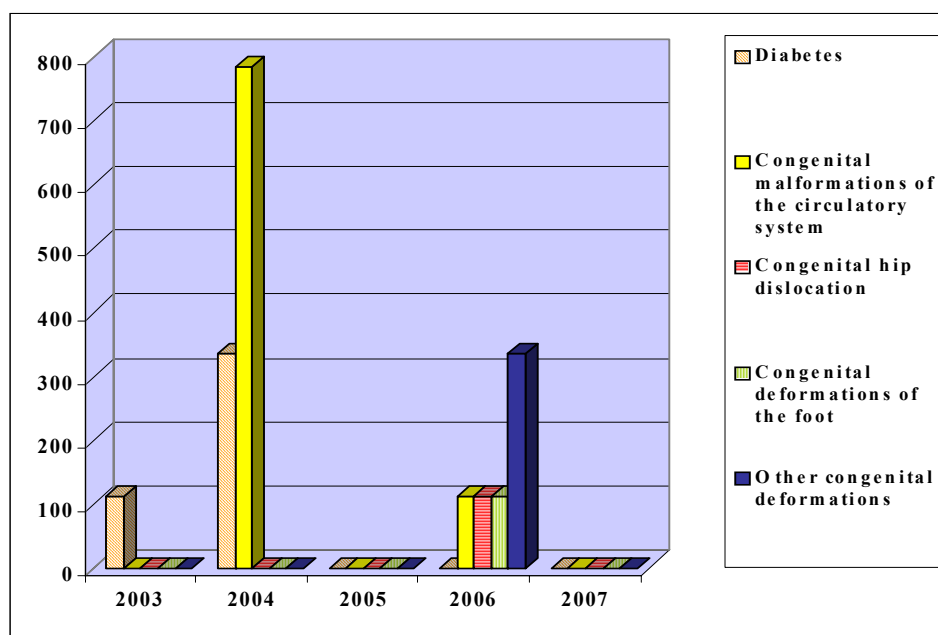


Figure 7. Incidence of conditions due to exposure to high nitrates concentration in drinking water from the town of Deta, at the age group 1–14 years

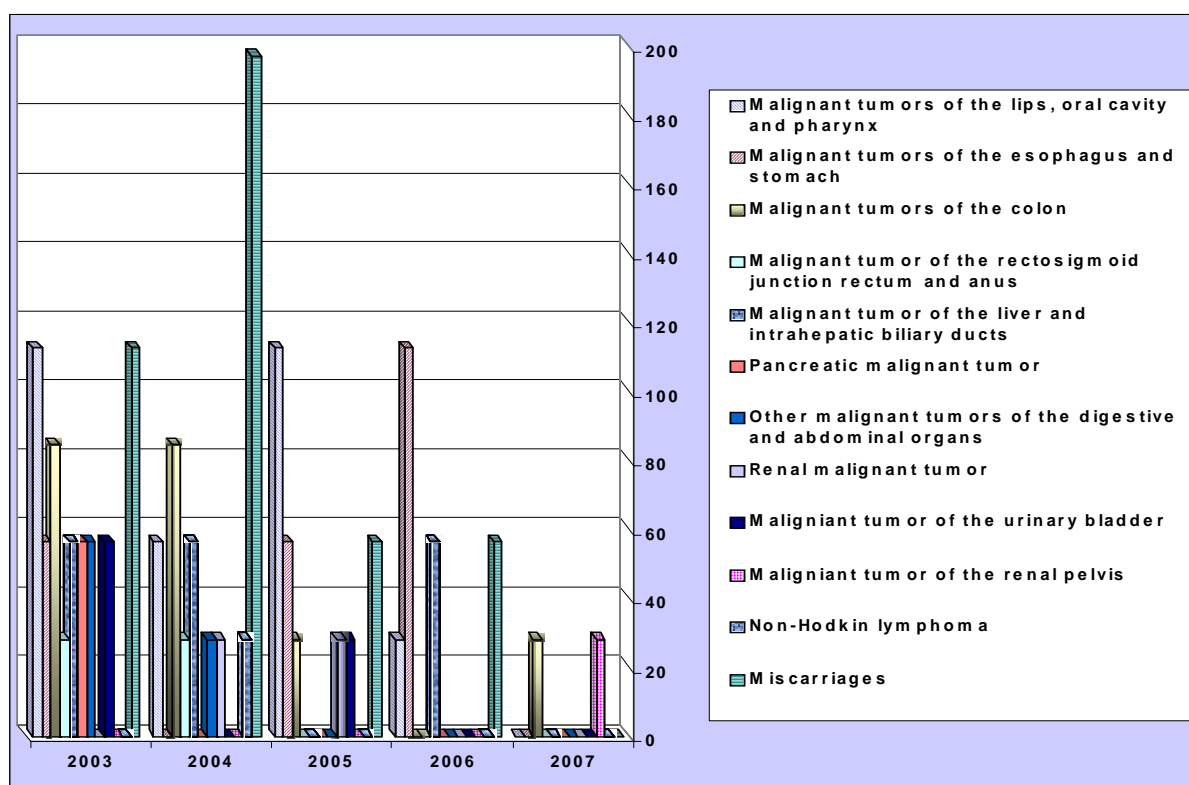


Figure 8. Incidence of conditions related to high nitrates concentration in drinking water from the town of Deta, in the age group 15 to 64 years old, during the 2003–2007 period

For the age group between 15 and 64 years old, the highest incidence was presented by the miscarriages, 197.46 new cases in 100 000 people in the year 2004. The malignant colon tumor's incidence registered a peak in the 2003 – 2004 period with 84.6 new cases in 100 000 people. In the year 2005, the

highest incidence was registered for malignant tumors of the lips, oral cavity and pharynx (112.83 new cases in 100 000 people), and in the year 2006 the maximum incidence was registered for malignant tumors of the esophagus and stomach (112.80 new cases in 100 000 people).

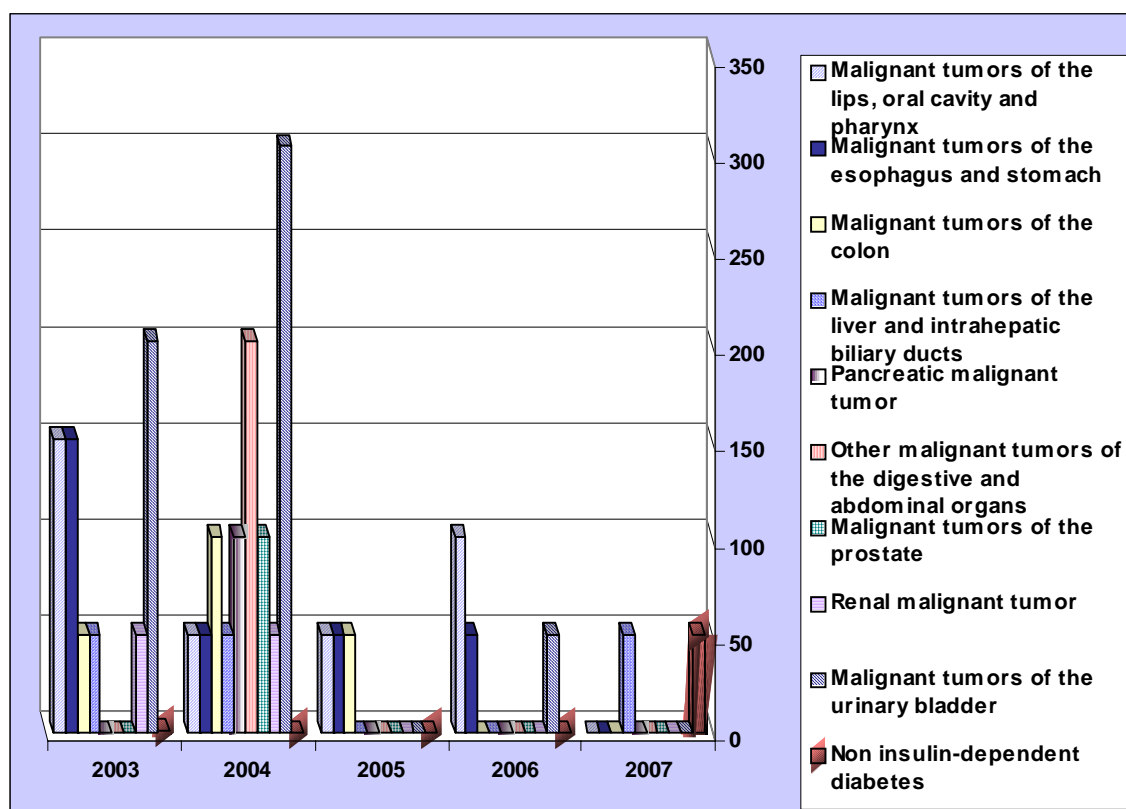


Figure 9. Incidence of conditions related to the high nitrates concentration in drinking water from the town of Deta, in the age group of 65 years and more, in the 2003–2004 period

The maximum values for the chronic conditions incidence were registered in the year 2004 in the age group of 65 years and more (bladder tumors, 304.1 new cases in 100 000 people and digestive tumors, 202.73 new cases in 100 000 people) and are represented in the Figure 9.

There is no valid evidence that nitrates and nitrites may lead to cancer in the absence of amines containing substance, which are necessary in order to form nitrosamines inside the human body. According to the new criteria from the United States Environmental Protection Agency (EPA)

nitrates and nitrites fit the category „insufficient information for assessing the carcinogenic potential” [12,16].

The member states present to the European Committee periodical official reports, at least once at 4 years, about the water quality, the nitrates vulnerable areas and agriculture and the results of applying the Nitrates Directive (91/676/EEC). According the reports from the 1992 – 2005 period, the highest nitrates concentration in drinking water is present in the West-European countries and the lowest in the Northern countries (below 5 mg/l) [20,21].

CONCLUSIONS

The differences between medium nitrates concentrations/source can be explained by:

- the type of water supplying source and the different depths where water is extracted from: the highest values were found in private wells (source – water table)
- the use of fertilizers in agriculture and the layout of individual sewerages systems; in Timis County there is intensive agricultural and zoo technical activity, representing the main nitrates water pollution sources.

Consumption of extremely high nitrates concentration water, especially in the 1993 – 2000 period (for private wells 250-130 mg/l), confirming the existence of old nitrates pollution, persistent and explains the population's exposure for a long time to high nitrates values. The water distributed through the centralized system had constantly higher values for nitrates than the maximum allowed concentration (MAC), between 50 and 70 mg/l.

Morbidity data from the Medical Statistic Burro of Timis County were incomplete, because of deficiencies in reporting from the territory.

Taking into account the long period of latency for this type of pathology (malignant tumors and non-Hodkin lymphoma 15-20 years), these morbidity indicators were

followed during the 2003-2007 period, after a long exposure period of 14 years to nitrates in drinking water [22,8].

Exposure of pregnant women to high nitrates concentration in drinking water was one possible cause for miscarriages (in the year 2004 there were the highest medium values – 106.85 new cases in 100 000 people), as well as for congenital malformations in new born children (the highest medium values were registered in the year 2003, 66.14 new cases in 100 000 people).

The responsible institutions must realize the water sources management: control of soil exploitation, respecting the legislation, respecting measures regarding constructions in the area of drinking water supplies, supervising and maintaining the water quality according to legislation, education of the population.

It is important to reduce the nitrates values in the centralized distribution system under the MAC and to increase the numbers of population supplied by the centralized distribution system, and the water distributed this way must be permanently monitored.

According to WHO recommendations, future epidemiological surveys have to assess exposure to nitrates by determining them in saliva, blood, urine–biomarkers [16].

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RISK FACTORS ASOCIATED WITH SEVERE EVOLUTION OF METHEMOGLOBINEMIA IN CHILDREN UNDER 1 YEAR OF AGE

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3. Olt County Public Health Authority

REZUMAT

Pornind de la premiza existenței unei rate mari a formelor cu evoluție severă în rândul cazurilor cu methemoglobinemie, studiul și-a propus identificarea unor factori de risc asociați cu evoluția severă. Au fost incluse cazurile diagnosticate cu methemoglobinemie în județul Olt în perioada 2005-2009 (N=90). Pentru estimare riscului a fost utilizat riscul relativ. A fost remarcată o scădere a frecvenței bolii în ultimii ani în rândul copiilor din județul Olt. Pentru vârsta sub 30 de zile evoluția către forme grave sau deces a fost de 1,28 ori mai mare comparativ cu cei cu vârsta de 1-3 luni și de 2,33 ori mai mare decât cei peste 3 luni ($p=0,039$). Alimentația artificială s-a asociat cu un risc de evoluție către o formă gravă de 2,19 ori mai mare decât alimentația mixtă ($p<0,005$). Analiza riscului evolutiv pentru forme grave a mai depistat un risc de 1,77 ori mai mare la fântânile de tip colectiv față de cele individuale. Factori de risc asociați cu evoluția severă a methemoglobinemiei au fost vârsta și sexul masculin iar dintre factorii extrinseci s-au desprins alimentația artificială, tipul de fântână colectiv și concentrațiile mari ale nitraților în fântâni. Studiul a remarcat și tendința de scădere a frecvenței methemoglobinemiei la copii.

Cuvinte cheie: methemoglobinemia, copii, factori de risc

ABSTRACT

Starting from the premise that there is a higher rate of severe forms of progression among cases of methemoglobinemia, the aim of the present study was to identify risk factors associated with severe evolution. There were included diagnosed cases with methemoglobinemia from Olt County during 2005-2009 period (N = 90). We use relative risk to estimate the risk. It was noted a decrease in the frequency of disease in recent years among children in Olt County. For children less than 30 days, the risk for progression to severe forms or death was 1.28 times higher compared to those aged 1-3 months, and 2.33 times for

those over three months of age ($p = 0.039$). Artificial feeding was associated with a risk of progression to severe forms of disease of 2.19 times higher than mixed feeding ($p < 0.005$). Risk analysis for severe forms has found a 1.77 times greater risk for the collective wells than for the individual wells. Risk factors associated with severe evolution of methemoglobinemia were male gender and age and from externals factors have emerged artificial feeding, collective well, and high concentrations of nitrates in wells.

Keywords: methemoglobinemia, children, risk factors

INTRODUCTION

Low urbanization level and intensive agriculture with consequential implications related to drinking water to rural communities [11] led over time to the appearance of many cases of methemoglobinemia, thus transforming a problem solved in most European countries [7-9] in another issue of public health in some countries [1,2,11,12]. The aim of the study was to identify a number of risk factors associated with severe evolution of methemoglobinemia in children less than one year old, starting from the premise that there is a high rate of cases with serious or fatal evolution.

MATERIAL AND METHOD

The study included evaluation of a number of 90 cases diagnosed with methemoglobinemia in children less than 1 year old for a five-year period between 2005 and 2009. All cases were from Olt County. The data were selected from reporting sheets of

methemoglobinemia cases of Olt County Public Health Authority.

Intrinsic risk factors (gender, age) and extrinsic risk factors (type of feeding, type of fountain, the well depth, nitrate concentration in water samples collected from wells) were analyzed. Risk analysis was performed using relative risk and statistical significance was accepted for $p < 0.05$. The statistics has received support of MedCalc software.

RESULTS

The number of cases of methemoglobinemia was decreasing from 29 cases recorded in 2005 and 2006 to only four cases recorded in 2009. For 2007 and 2008 there were reported 11 and 17 cases. In 2005 there were three deaths, in 2006 and 2007 one death in each year in patients with methemoglobinemia. In the last two years no death was recorded (Figure 1).

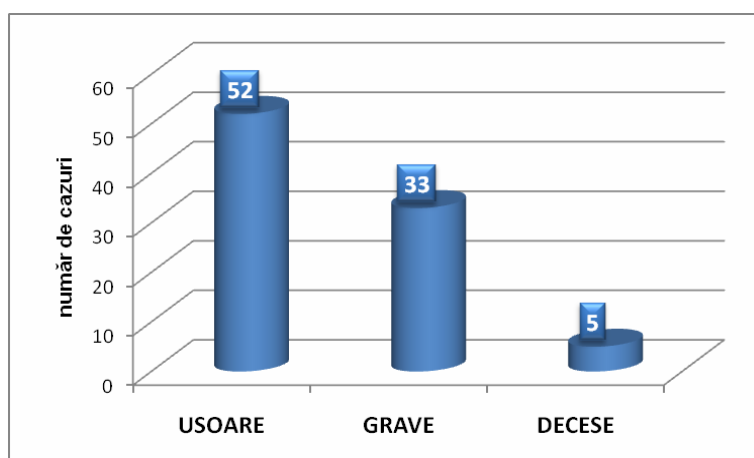


Figure 1. Distribution of different evolution forms of methemoglobinemia

Of the three types of evolutive forms, mild forms prevailed in 52 patients, representing 57.78% of all cases of methemoglobinemia analyzed. Severe forms were present in 36.67% of the total number of cases. Fatality rate was 5.56%, registering a total of five deaths (Figure 2).

A large proportion of serious cases were identified in the last two years of study, 53.85% (7/13) in 2008 and 50% in 2009 (2/4) compared to previous years, when the cases developing severe forms represented 18.75% (3/16) in 2007, 31.14% (9 / 28) in 2005, and 31.03% (9 / 28) in 2006.

Differences in frequency of severe forms of evolution in terms of area of origin, were not identified, all cases coming from rural areas. It was noted however, that all deaths occurred in boys, risk of death is thus 5 times higher in boys compared to girls ($p = 0.027$). Sex ratio expressed higher levels of severe forms in boys (1.37) compared with

mild forms (1.16), the risk of boys being 1.47 times higher ($p = 0.07$).

Young ages were most affected, half (45/90) of cases with an age less than a month and 30 cases were at the time of disease occurrence over three months of age. At only 16.67% of cases age was more than three months. Age was a risk factor for the form of disease also, 42.22% (19 cases) of cases under the age of 30 days showing severe forms, unlike children aged 1-3 months who developed severe forms in 62.07% and those aged over 3 months in only 19.54%. Of the five cases with methemoglobinemia in which death was recorded, four cases were infants (<30 days) and one case occurred in a child aged 2 months (Figure 2). For age less than 30 days, the shift towards severe forms or death was 1.28 ($p = 0.02$) times higher compared to those aged 1-3 months and 2.33 times to those over 3 months ($p = 0.039$).

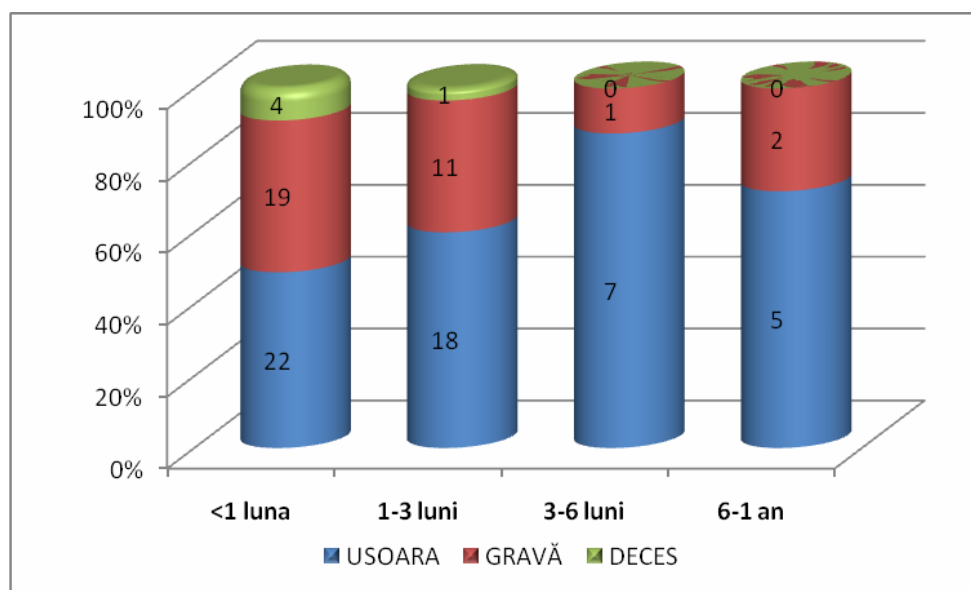


Figure 2. Distribution of evolutionary forms in cases of methemoglobinemia

Methemoglobinemia frequency was identified three times higher in the first half of the year compared with the second half (65/25). There was a maximum frequency in January-February and March-April, the four months cumulating 52 cases, representing

over half of all cases. Interval with the lowest frequency of cases was from June to August, when there have been only 11 cases (12.22%), in any year the methemoglobinemia frequency was not exceeding 21%.

Formula feeding (47 cases) and mixed alimentation (42 cases) was predominantly, just one case benefiting of breast feeding as outlining major risk profile of the child fed with formula [1,3,6,10,13]. Mixed feeding was a protective factor for some forms of illness. Only 23.81% of the cases with mixed alimentation had severe forms, compared with 48.94% of cases formula fed, the risk of progression to a severe form being 2.19 times higher for formula fed children compared with those with mixed alimentation (RR=2.19, CI 95%, 1.20-4.02; $p<0.006$). A similar risk, of 2.13 times was observed for the presence of acute diarrhoeal disease in children formula fed (42.55%) compared with those with mixed alimentation (24.39%) (RR = 2.13; CI95% 1.11 to 3.56, $p = 0.021$), showing the protective role of breast feeding.

Almost half of the cases (39) presented association with acute diarrhoeal and respiratory diseases. Only eight cases (8.99%) were associated only to respiratory diseases, a greater number of cases presenting only acute diarrhea, 18 cases (20%). No significant associations were identified between the evolution of disease and the presence of acute diarrhoea or respiratory disease, the only observation is that their frequency is decreasing with the increase of age.

Although individual wells predominated as a source for drinking water, a significant impact was noted for collective wells (20, 22.22%), which are rare in local communities, most residents ensuring their water from their own drinking wells. A worrying aspect is related to compliance with the location, construction and maintenance of these collective wells. Of the 22 wells of this type, only one was provided with protection, 95% being located closer than 10 m from latrines. In over half (14/20) of them depth was below than 10 m., and only one well had a depth exceeding 20 meters. Neither for individual wells the

situation is not better, 18.84% being provided with protection and only 15.71% being placed at a distance over 10 m from latrines. Almost half (34/70) of the individual wells had a depth between 10 and 20 meters, and 35.71% were below 10 m depth. Only 15.71% of the individual wells were over 20m depth.

In terms of risk analysis, the risk for severe forms was observed (RR = 1.77, IC95% 1.14 to 2.77, $p = 0.024$) to be higher for the collective wells. The incidence of severe forms (50%) was 1.5 times higher, and mortality was (15%) over five times higher if compared with the individual wells, that have prevailed in mild forms 64.29% of cases (45/70).

High level of nitrates ($>100\text{mg/l}$) in wells was found mainly in cases where the evolution has been severe. Almost half (31/70) of the cases where nitrate concentrations exceeded 100 mg/l had severe evolution, as opposed to those in which the nitrate concentration was below the threshold where severe evolution was recorded only in 30% of the cases (6/20) (RR = 1.40, IC95% 1.19 to 2.85, $p = 0.032$).

The risk was statistically insignificant (RR = 1.27, CI 95% 0.5 to 2.77, $p = 0.51$) for children under 30 days, the incidence of severe forms being 56.41% (22/39) for nitrate concentration over 100 mg/l and 44.44% at concentrations below 100mg/l. For age group 1-3 months, the incidence of sever forms for concentrations over 100 mg/l was 45.46%, being identified a risk 1.59 times higher in this category up against babies with the same age, but with concentration less than 100 mg/l (RR = 1.59, CI 95% 0.4 to 3.6, $p = 0.43$). The lowest incidence of severe forms was observed in children over three months old at nitrate concentration above 100 mg/l (25%), 3 times higher than for nitrate concentrations below 100 mg/l.

Although, theoretically a higher depth will result in less risk of nitrate poisoning and will increase the safety of drinking water [4,5,13] in our study we observed high concentrations in deep wells. In 89 of the 90 water samples collected, the nitrate concentration values were greater than 50 mg/l. Surprisingly, in all samples collected from wells with depth over 20 m, concentrations above 100 mg/l were detected, unlike samples from wells with depth between 10 and 20 meters, where concentrations above 100 mg/l were identified only in 79.43% of the samples, respectively 69.23% of samples from wells with a depth below 10m. Greater depth of wells was correlated with lower levels of coliform germs, and the risk was over 3.5 times higher for wells with a depth below 10 meters compared with wells with a depth over 20 meters.

However there was a lower frequency of severe forms related to wells with greater depths. Thus, 75% (9/12) of cases where deep wells exceeded 20 meters showed mild forms, compare with 55.13% of cases where the depth of the well was less than 20 meters.

DISCUSSIONS

Progress in creating and upgrading of drinking water networks in recent years and the concern for ensuring an optimal level of awareness about the risk of using water from unsafe sources, have helped to reduce the frequency of cases in recent years.

The explanation for the increasing share of cases with severe evolution could be linked

to the percentage of young age children having an evolution of illness generally more severe than in older ages (6,13). Average age was 38.25 days in 2009 and 41.84 days in 2008 compare with 96.12 days in 2007 and 51.97 days and 52.26 days for 2005 and 2006.

Remains extremely important to ensure the collective wells, whose impact was significant in our study because of the high rate of methemoglobinemia cases having as water source such wells. If for individual wells control is limited [5,11], for collective wells the responsibility of local authorities should include concern to ensure safe water from these wells, or prohibit use if is necessary. Study results identified security breach of the national rules and regulation for most collective fountain, indicating a higher concentration of both nitrates and coliform germs.

Methemoglobinemia is one of the paediatric emergencies with trend to severe evolution [6] but knowing and limiting associated risk factors may provide useful strategies to combat them. The study identified several factors involved in the development of severe forms. Among them were formula feeding, age and type and quality of water source. The severe evolution involves many intrinsic and extrinsic factors whose interaction makes their identification difficult. The relatively small number of cases diminished the statistical significance of the present study; further research on larger studies will allow a more eloquent risk profile in children with severe forms of methemoglobinemia (Table 1).

Table 1. Risk of methemoglobinemia

Risk factor	Relative Risk	p
Intrinsic		
Male	1.47	0.07
Age <30 days	2.33	0.02*

Extrinsic		
Formula feeding	2.13	<0.005*
Collective wells	1.77	0.024*
Well depth <20m.	1.81	0.059
Nitrate concentration >100 mg / l	1.40	0.34*
*statistically significant		

CONCLUSIONS

Methemoglobinemia frequency in children under the age of one showed a clear decreasing trend in recent years and severe forms of development have confirmed the decline especially in children older than three months.

Risk factors associated with severe evolution of methemoglobinemia were

young age and male sex and of extrinsic factors have emerged formula feeding, collective well and high concentrations of nitrates in wells.

High potential of severe evolution of methemoglobinemia justify identification and control of associated risk factors, thus ensuring reduced frequency and incidence of severe forms of illness among children.

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SEXUAL, MARITAL AND REPRODUCTIVE PATTERNS IN CRAIOVA

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REZUMAT

Context. Caracterul multifactorial al comportamentului sexual-reproductiv este general acceptat; alături de influențele biologice, cele socio-culturale joacă un important rol în determinismul său. **Metode.** Un număr de 600 de subiecți, bărbați și femei, rezidenți în Craiova, au răspuns unui chestionar conținând itemi referitori la prima relație sexuală, prima căsătorie și nașterea primului copil. **Rezultate.** Băieții au un comportament mai liberal decât fetele în privința sexului premarital. Tinerii se îndepărtează de modelul familiei tradiționale; veniturile reduse îi determina să amâne momentul căsătoriei. Adaptările comportamentale, eforturile de a susține o familie și nașterea copiilor sunt considerate obstacole în cariera profesională. **Concluzii.** Studiul evidențiază modelul familiei cu un singur copil. Reducerea natalității se datorează amânării și evitării nașterii celui de-al doilea copil.

Cuvinte cheie: prima relație sexuală, căsătorie, familie cu un singur copil

ABSTRACT

Context. The multifactor defined character of the sexual reproductive behaviour is generally accepted; social and cultural influences play an important role in its determination, beside the biological one. **Methods.** We have questioned a number of 600 subjects, men and women, living in Craiova, about three important events of their lives: first sexual intercourse, first marriage and birth of the first child. **Results.** Boys have a more liberal attitude comparing with girls regarding the pre-marital sex. Young people go away from the traditional model of family; precarious incomes lead them to postpone the marriage moment. The behavioural adjustments, the efforts to sustain a family and the children birth are considered obstacles for the professional performance. **Conclusions.** The model of a family with a single child gets evident. The natality decrease is due to the postponing and avoidance of the second child birth.

Keywords: first intercourse, marriage, single child family

INTRODUCTION

Human sexual behaviour has been a constant concern for people and specialists in sociology psychology, medicine and anthropology as well [1]. It has already been stated that human sexual behaviour is influenced by a diversity of factors and it is regarded as a result related to educational, cultural, psychological, biological and physiological background [2]. Thus the factors influencing sexual and reproductive patterns can be categorized in super individual and individual factors.

The super individual factors (legislative, social, cultural, religious, economical factors) operate at the macro social level. Therefore a behavioural pattern specific to a certain period of time due to socializing and education was created. It is noted a two interactive vectors relation: on one hand the legislative constraint turns into habit and, on the other hand, the habit has so strength that it turns into coercion.

Regarding the individual factors, it is noticed conscious actions in influencing the fertility level and calendar. The single/couple decides and acts so that they should give birth at a certain number of children at some intergenesis periods of time [3].

On these terms, our study aims at underlying some present trends of sexual and

reproductive behaviour of a population living in urban area.

SUBJECTS AND METHOD

Two questionnaires with 111 items for both sexes and 8 additional items for the females were drawn up to achieve the goals of the project this study is a part of.

A number of 600 people living in Craiova, between 15 and 75 years old, equally divided in gender, age and educational level groups, answered the questions. People were randomly selected. There were six age groups (15-25, 25-35, 35-45, 45-55, 55-65, 65-75) and three educational level groups (low, medium, high). The questionnaire was applied by an interview operator.

Data were processed using SPSS computer program. The statistical significance of the data was evaluated using the χ^2 test.

The present study is concerned with the findings regarding the enquiry on the proper age of starting sexual activity, marriage and first child birth.

RESULTS

First intercourse

In our group, the χ^2 test underlines a statistically significant correlation ($p < 0.05$) between the age of the first sexual contact and the age considered proper for the sexual activity beginning (Figure 1).

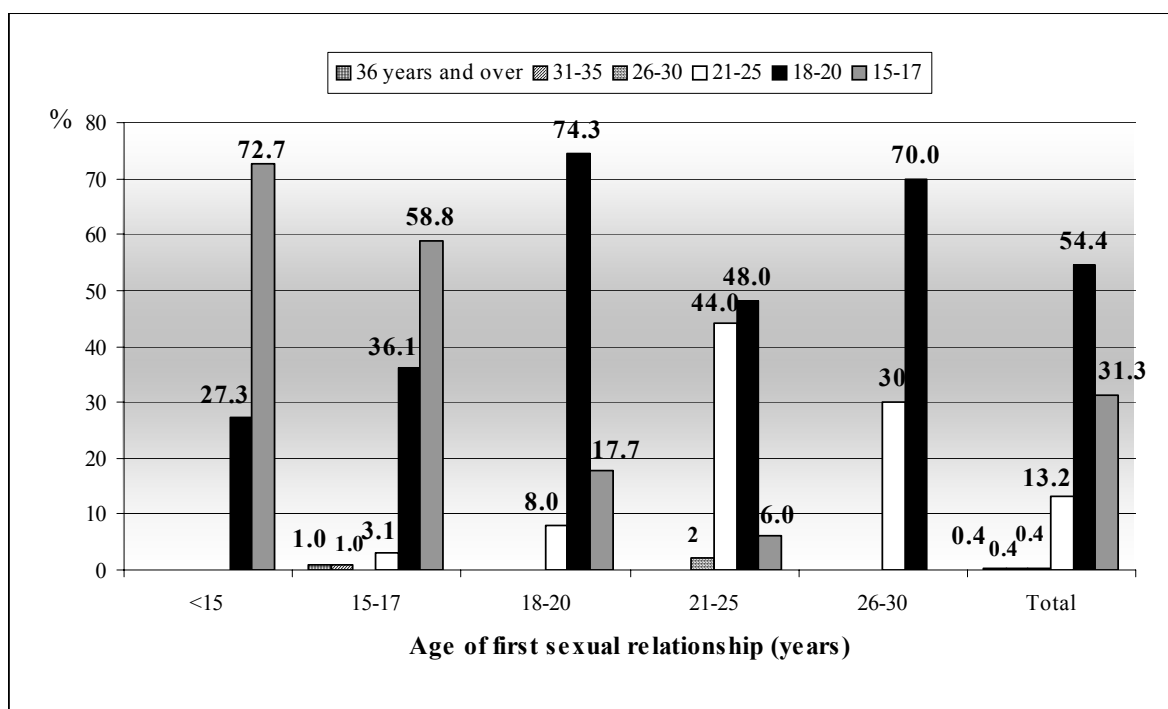


Figure 1. Statistical distribution (%) of subjects according to the correlation between the age of their first sexual intercourse and the age considered adequate for the first sexual intercourse

In the subjects responses there is a tendency of regarding the same age they started sexual activity as being proper or even an earlier age. Thus, the ones whose first sex was at the age between 15 and 20 considered it proper on the matter; the ones who started their sexual activity after the age of 21 agreed with an earlier age (18-20 years old) for sexual activity start. It has to be noted therefore a model with a smaller average age in sexual beginning with two tops (15-17 and 18-20 years old), at least at desideratum level.

There have to be some other aspects noticed according to our data:

- boys are more tolerant about premarital sex life and start their sexual activity earlier than girls;

- boys prefer an adventurous relation for their first sex, while girls would rather start a stable relation;
- boys consider their first sex as absolutely necessary in gaining experience, while girls associate it with “the great love”;
- boys and girls as well appreciated the first sexual intercourse as a pleasant event, a step of certifying maturity.

Marriage

The results of this research (Figure 2) show statistically significant differences ($p < 0.05$) between the age the subjects got married and the age considered more favourable for getting married.

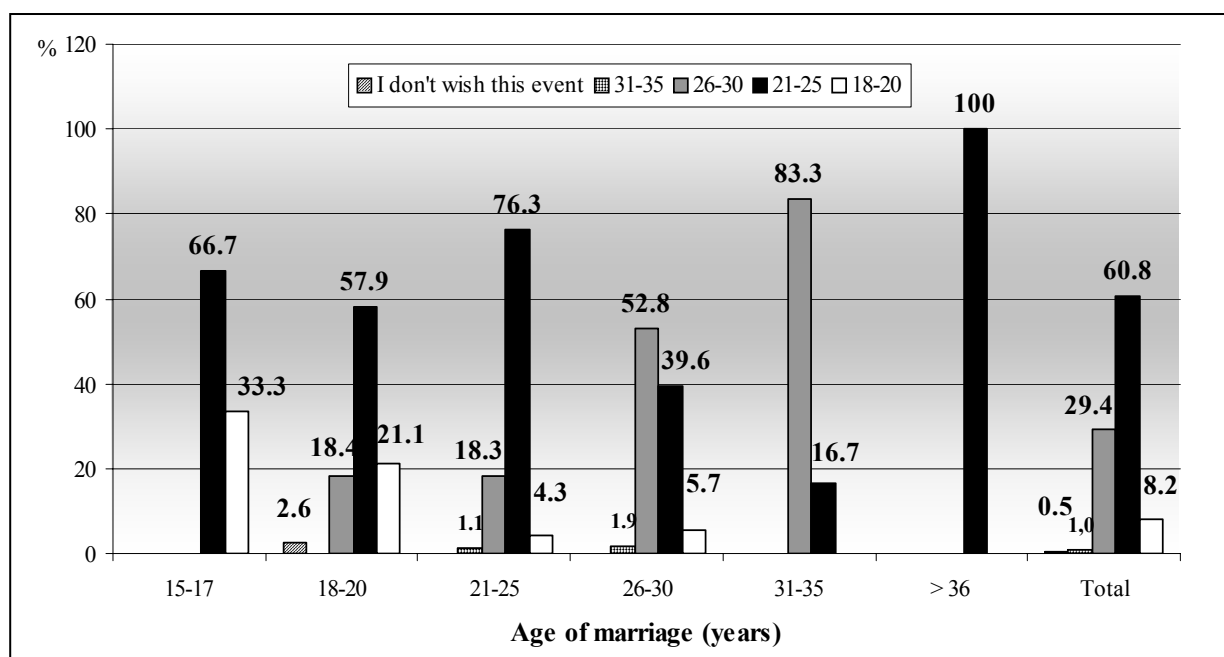


Figure 2. Statistical distribution (%) of subjects according to the correlation between the age of their first marriage and the age considered adequate for the first marriage

In this respect there could be noted three tendencies:

1. the obvious tendency that the proper marriage age should be bigger than the subjects got married (the ones married at 15-20 years old consider as proper the age of 21-25);
2. the tendency of considering as proper a smaller age than the age the subjects got married (26-30 years old at subjects married at 21-35 or over 36);
3. the tendency of considering as proper the age the subjects got married (at more than $\frac{3}{4}$ of people married at the age of 21-25 and at more than $\frac{1}{2}$ of those married at 26-30 years old).

Thus, at the total number of people subjected on the proper marriage age, it can be noted a bimodal curve with a higher rising top at the age of 21-25 (considered as most favourable by 365 people - 60.8%) and a lower one (N = 176, meaning 29.3%) at the age of 26-30 years old.

First child birth

In our group 232 people (38.6%) do not want any more children, most of them having already one child (Figure 3).

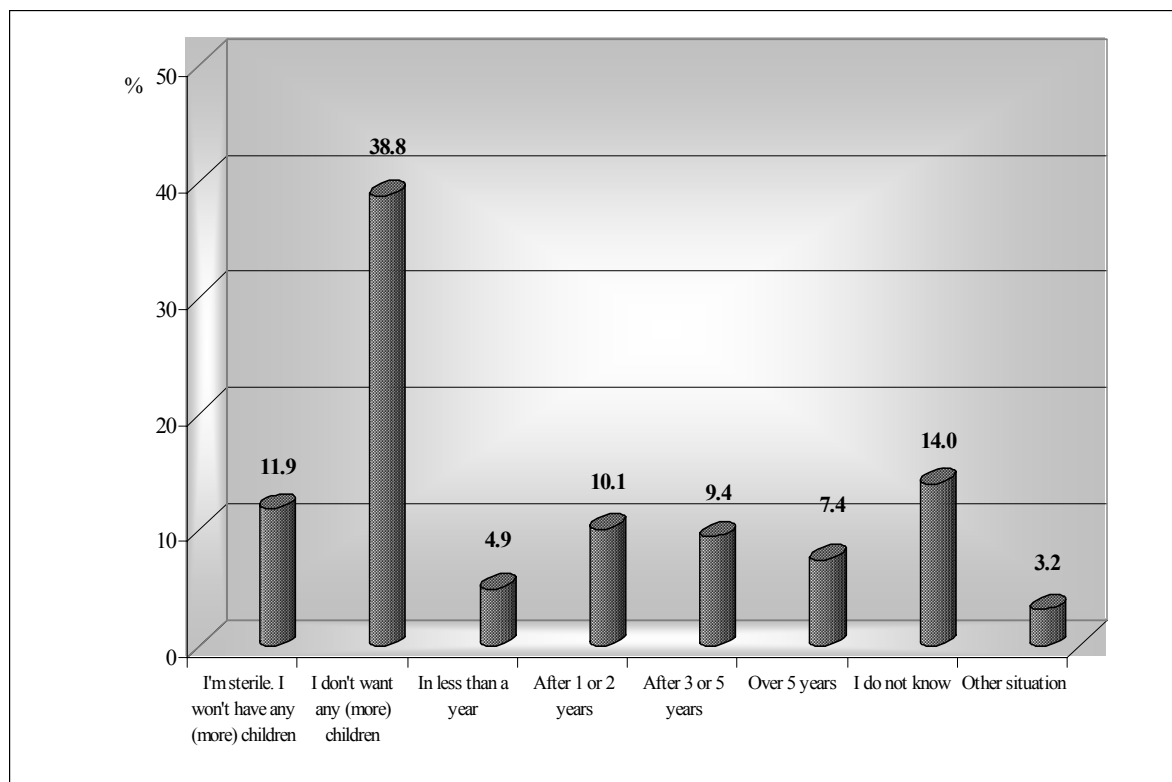


Figure 3. Statistical distribution (%) of subjects according to the pregnancy planning

About 16.8% out of the very young subjects (aged 15-24 years old) do not know if they desire to be parents or postpone childbirth over a period of three to five years or more. Fifteen percents out of the group aged between 25 and 30 years old have intended to become parents in a period of time up to one year or one-two years long.

The responses underline the fact that childbirth limitation or its time planning is related to school training and economical status of the couple. The first child birth is postponed until the proper financial and training status is carried out.

The biological age overcomes the social one especially at women, so that the delay of pregnancy over the age of 35 years old requires the monitoring of the pregnant woman and her conceptual product. The emotional and affective resources necessary in bringing up the child must be also taken into account because they decrease with the time, being in ageing process.

The χ^2 test indicates statistically significant differences ($p < 0.05$) between the age of first childbirth and the age considered proper for this event (Table 1).

Table 1. Statistical distribution (%) of subjects according to the correlation between the age of first birth and the age considered optimal for the first birth

Age of first birth (years)	Age considered optimal for the first birth (years)				
	I do not wish this event	31-35	26-30	21-25	18-20
15-17				100.0	
18-20	5.9	5.9	29.4	52.9	5.9
21-25			34.2	<i>64.5</i>	1.3
26-30		5.7	<i>60.4</i>	34.0	
31-35		14.3	57.1	28.6	
> 35		20.0	40.0	40.0	
Total	0.6	3.8	43.1	51.3	1.3

As it was expected, the resonance in the variations of responses concerning the proper age for marriage could be noted: couples who had their first child at the age of 15-20 consider the age of 21-25 years old as most favourable for childbirth. The ones who had him/her at the age of over 31 admit that the birth should be earlier, at the age of 26-30 years old. More than a half of the people who became parents at 21-25 and 26-30 years old consider these two age groups are most favourable for this event.

There are two aspects that should be underlined in this respect: (1) in spite of the small number, there were subjects who reported they did not want to have a child; (2) almost a quarter of subjects did not agree with the second rank birth.

DISCUSSIONS

The study started the analysis of the sexual and reproductive behaviour of the people subjected to the survey from the socializing role of the family with its own traditional values which tends to perpetuate certain patterns, at least at one generation level, regarding the example given. It is obvious that the family model could be modified by

individual, social or legislative factors, but, under relatively constant circumstances, the average age in beginning sexual activity, marriage and child birth proves certain inertness.

First intercourse

The sexual activity has its ups and downs or its constancy depending on the biological status and the hormonal mechanisms generated by puberty, menopause, andropause, old age and senescence. The start of sexual activity concerns puberty and adolescence. In Romania, the beginning of puberty period at the age of about 13 years old girls and 14 years old boys (considering the catamenia and pollution advent) generates the real beginning of sexual impulses [4].

Consequently the sexual activity is different depending on the biological sex, but it is also influenced by the cultural pattern which has always had a double value of education and perception. Women sexual life before marriage was regarded as a matter of "honor lost", while premarital sex life at men was associated with masculinity or virility and was considered as a necessity, because it

used to be said: “it is not shameful, but it has to boast about playing around secretly before marriage” [5].

The different opinions of boys and girls in our study could be explained taking into consideration one year girls advance in psycho-somatic development comparing to boys at the same age. The boys present a more tolerant attitude towards pre-marital sex because of their autonomy, freedom and even encouragement in approaching sexual activity [6].

Marriage

Marriage has a great importance in acknowledging the adult and in stating his/her social and economical maturity, even if the facts could be different. The singles are regarded as individuals who have a certain problem, though they are not regarded as pariah as in traditional communities. In spite of its importance, the union through marriage occurs at an older age and is more and more substituted by free unions out of marital status [7].

Marriage is considered the means accepted at social level of forming a two or more people family. The nuptial patterns have been changed and it can be noted marriage as not being regarded as sacred any longer, the importance of socio-economical marriage reasons decrease, the equality of men and women status at marriage, the decrease or even disappearance of the parents and relatives role in the youngsters marriage, the nuptiality decrease having as result a lower rate of childbirth [8].

The cultural Romanian family pattern has preserved some traditional characteristics such as: the universality of marriage, free unions and celibacy at total insignificant rates, the relative precocity in creating couples in or out marriage unions, the absence of voluntary maternity out of marriage with very few exceptions [9].

In the last three decades the society has become more tolerant with the premarital sex life, one of the reasons why being that the average marriage age has risen in Europe at the rate of almost two years. Despite the differences of family patterns between north and south or west and east, a tendency in the average marriage age similarity and nuptial rates falling must be noticed in all these areas [10].

It must be taken into account the youngsters propension to marriage, their marriage desire being motivated by the common wish in having their own family, by their needs of love and affection and the desire of having children. At the same time the youngsters consider as obstacles in creating a family the economical constraints and the compulsion of being enrolled at higher and higher professional standards. Youngsters commit to marriage later than in the past, marriage becoming more and more a utilitarian engagement though the commitment has its emotional basis [6].

First child birth

For contemporary families, children represent on one hand a source of financial and symbolic profit - unpaid labour manpower, old age or illness support, personal fulfilment feeling, emotional and other moral qualities such as self sacrifice expression possibilities. On the other hand children represent an assembly of financial costs regarding the additional expenses in order to benefit the same life standard as non-children families, psychological changes regarding the inadequate old family behaviour patterns, interactive (most couples admit changes in their emotional and sexual relations after children birth) and social changes noticed especially at couples with intense social life style [11,12].

CONCLUSIONS

The results of our study show a tendency of postponing childbirth comparing to past

periods of time. That is generated by different kinds of causes such as:

- *financial causes*: financial instability, small incomes, living space crisis;
- *professional causes*: one of the parents should sacrifice his/her career opportunities to raise the child. The woman usually does sacrifice it because the professional identity is well-defined at men who hardly could renounce his future career prospects;
- *educational-emotional causes*: it is noted the absence of a responsible partner for paternity that requires a spouse as financial support and educational-emotional resources as well;
- *legislative causes*: contraceptive methods and abortion banning created a real psychosis at women in the past. As a result, after 1989, women feared of giving birth to children (despite their fertility) and they transmitted a sort of maternity phobia to their daughters.

Similar to other researches made in Romania, our study results indicate that the

concern regarding social and economical changes with certain impact on family life, the establishing of youngsters family values criteria and aspects such as free union out of marriage, celibacy or voluntary maternity out of marriage as well have been less taken into account. Consequently there should be considered as priorities the political and social factors responses to particular family forms and its specific problems (monoparental families' support) and the legal political and social involvement in the family values criteria as well.

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EPICOM PROJECT AND ITS IMPLIMENTATION IN ROMANIA

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REZUMAT

Scopul muncii noastre este de a evalua tendințele epidemiologice a bolii inflamatorii intestinale (IBD), în partea de vest a României, în județul Timis, pentru perioada de 9 luni. Am inclus în studiul nostru pacienții diagnosticați cu IBD în perioada ianuarie 2010 - septembrie 2010 în județul Timis. Am analizat incidența IBD, și de asemenea, următoarele variabile: vârstă, sex, IBD typ. Au fost diagnosticate 12 cazuri de IBD pentru perioada de 9 luni, 7 cazuri de UC și 5 cazuri de CD-uri. În cazul în care progresia de includere va continua în același ritm, ne așteptăm pentru a diagnostica 29 de cazuri de IBD / 2010 → 4.36 noi cases/100.000 locuitori.

Cuvinte cheie: boli inflamatorii intestinale (IBD), colita ulcerosa(UC), boala Crohn (CD)

ABSTRACT

The aim of our work is to evaluate the epidemiological trends of inflammatory bowel disease (IBD) in the west part of Romania, in Timis county, for the 9 month period. We included in our study the patients diagnosed with IBD during the period of January 2010-September 2010 in Timis county. We analyzed the incidence of IBD, and also the following variables: age, gender, IBD typ. There were diagnosed 12 cases of IBD for the 9 month period, 7 cases of UC and 5 cases of CD. If the progression of inclusion will continue at the same rate, we expect to diagnose 29 cases of IBD/ 2010 → 4.36 new cases/100.000 inhabitants.

Keywords: IBD(inflammatory bowel diseases), (UC) ulcerative colitis, (CD) Crohn's disease

BACKGROUND

This European trial in 27 countries representing adult and pediatric inception cohorts from 17 Western and 9 Eastern European countries and 1 Asian country will primarily aim at description of differences in Environmental factors. Differences in the 1 year's follow-up regarding disease course,

medical treatment, surgery, quality of life, impairment of work, cancer and death will be analyzed.

The incidence of IBD varies greatly worldwide, with incidence rates of UC and CD varying between 0.5-24.5/105 inhabitants and 0.1-16/105 inhabitants respectively. The highest incidence rates are

recorded in North America and Northern and Western Europe, while lower rates are recorded in Africa, South America and Asia, IBD being more common in developed, more industrialized countries.

The overall aim of this study is to investigate whether there is an east-west-gradient in European countries in the incidence of IBD, and furthermore, if the difference in IBD is being caused by environmental factors. In addition, we will assess whether there is a Europe-China gradient in the incidence of IBD.

Secondarily at 1 year follow-up, our aim is to assess: the geographical effect on disease severity; prognosis in terms of progression of disease, surgery, mortality and cancer; the effect of different economical considerations on choice of treatment (immunosuppressive, biologic, surgery); vitamin D levels; the prevalence of extra intestinal manifestation;

quality of life and quality of care gradient across Eastern and Western Europe; work productivity and activity; the impact of migration [1-9,11,12].

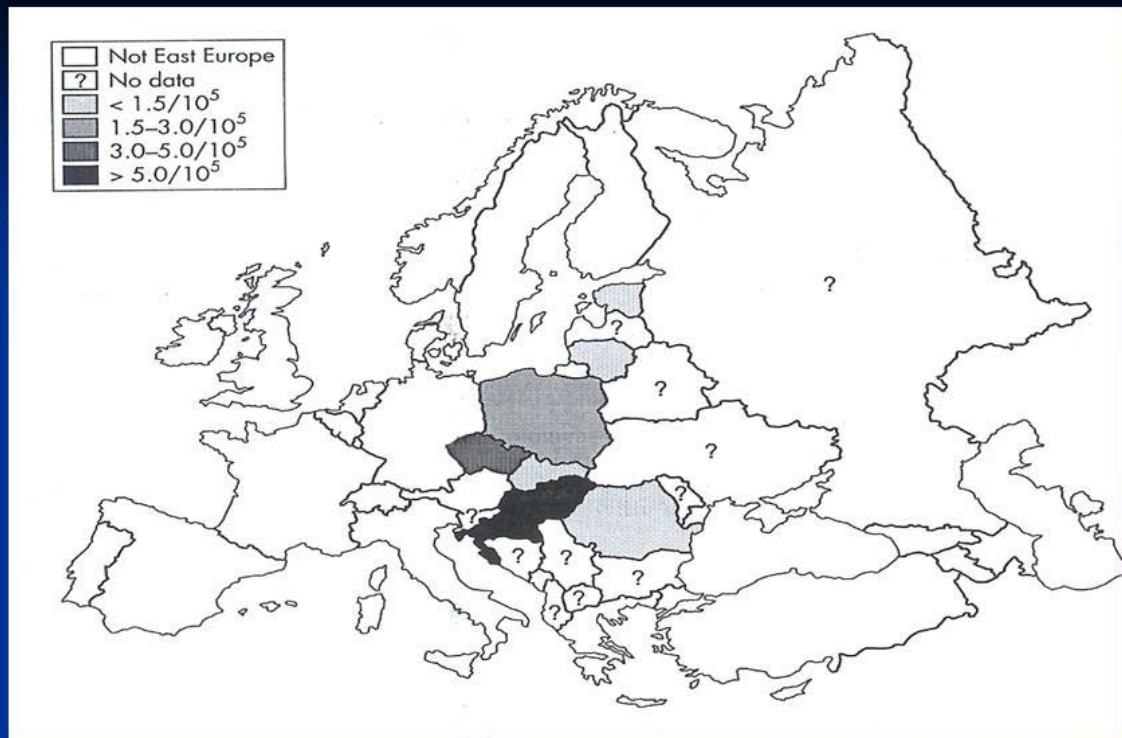
AIM

The study aims to include centers from both Western and Eastern Europe, and three centers in China, thereby creating a new prospective, uniformly diagnosed, population-based inception cohort of patients with IBD within well-described geographical areas (Table 1, Figure 1).

The populations have to be stable, with little immigration or emigration, and to number not less than 250,000 residents in a defined area, in order to ensure adequate case recruitment of rare diseases. The aim of our work is to evaluate the epidemiological trends of inflammatory bowel disease (IBD) in the west part of Romania, in Timis.

Table 1. Epidemiology of IBD in Eastern European and Baltic countries [10]

	Observation period	Study design	UC		CD	
			incidence	prevalence	incidence	prevalence
Hungary						
Lakatos <i>et al</i> ¹⁸	1977–2001	Population based, prospective	5.9 (1.6 to 11.0)	142.6 (2001)	2.2 (0.4 to 4.7)	52.9 (2001)
Nagy <i>et al</i> ¹¹	1962–1992	Hospital based, retrospective	3.1 to 3.6		0.4 to 1.0	
Croatia						
Jovanovic ²⁴	1973–1994	Population based, retrospective			0.34 to 3.47	
Vucelic <i>et al</i> ^{22, 23}	1980–1989	Population based, prospective	1.5	21.4 (1989)	0.7	8.3 (1989)
Mijandrusic Sinic <i>et al</i> ²⁵	1995–2001	Population based, retrospective	3.9 to 5.9	53.9 (2001)	3.9 to 5.7	46.4 (2001)
Czech Republic						
Nedbal <i>et al</i> ²⁶	1960–1965	Single centre, retrospective	1.4	10.4		
Bitter <i>et al</i> ²⁷	1975–1990	Population based, prospective	3.1	39.2		
Kolek <i>et al</i> ²⁸	1990–1999	Population based, prospective (children)	0.5 to 1.5		0.3 to 1.5	
Poland						
Wierska-Drapalo <i>et al</i> ²⁹	1990–2003	Single centre, retrospective	1.8		0.1	
Romania						
Gheorghe <i>et al</i> ³³	2002	Hospital based, prospective	0.97	2.4	0.5	1.5
Slovakia						
Prikazka <i>et al</i> ³⁴	1994	Hospital based, prospective				6.75
Baltic countries						
Salupere <i>et al</i> ³⁵	1993–1998	Population based, prospective	1.7		1.4	
Kull <i>et al</i> ³⁶	1973–1992	Hospital based, retrospective	1.5		0.3	



Lakatos L. – Is the incidence and prevalence of IBD increasing in Eastern Europe. Postgrad Med J. 2006

Figure 1. Incidence and prevalence of IBD [10]

MATERIALS AND METHODS

Our study centre covers Timis county, which has 664.433 inhabitants, out of which 423.110 are living in urban and 241.323 in rural areas; the total surface is of 8697 sq Km and the density is of around 76 inhabitants/sq Km.

As referring age groups, we have the following distribution: 0-1 year - 6732 inhabitants (1.01%); 1-4 years-25.363 inhabitants (3.82%); 5-10years - 29.668 inhabitants (4.47%); 10-14 years- 32.546 inhabitants (4.90%); 15-39 years- 263.385 inhabitants (39.64%); 40-60 years - 184.497 inhabitants (27.77%); over 60 years – 122.242 inhabitants (18.40%). Ethnic groups: 81% Romanians, 14% Hungarians 3% Germans and 2% other. There are 318

GP's and 15 gastroenterologists and pediatricians involved in IBD.

Department of Gastroenterology and Hepatology - Referral center for the western part of the country, serving another 4 counties besides Timis county, with a total population of over 1.500.000 inhabitants.

The department has 45 beds

- 13 specialists in gastroenterology
- 15 fellows in gastroenterology
- 1300 colonoscopies and 3000 gastroscopies/year

Inclusion criteria Copenhagen Diagnostic Criteria (CD) (at least two of the criteria present) [3]:

1. History of abdominal pain, weight loss and/or diarrhea for more than three months

2. Characteristic endoscopic findings of ulceration (aphtous lesions, snail track ulceration) or cobblestoning or radiological features of stricture or cobblestoning
3. Histopathology consistent with Crohn's disease (epithelioid granuloma of Langerhans type or transmural discontinuous focal or patchy inflammation) [13]
4. Fistula and/or abscess in relation to affected bowel segments [14].

Inclusion criteria Copenhagen Diagnostic Criteria (UC)(all three of the criteria present):

1. History of diarrhea and/or rectal bleeding and pus for more than one week or repeated episodes
2. Characteristic endoscopic findings of continuous ulceration, vulnerability or granulated mucosa
3. Histopathology consistent with ulcerative colitis (neutrophils within epithelial structures, cryptitis, crypt distortion, crypt abscesses) [13].

Exclusion criteria:

1. Infectious gastroenteritis
2. Entamoeba
3. Cancer.

At inclusion the patient will be asked to fill out the environmental factor questionnaire

while the investigator fills out: diagnostic criteria scheme; sIBDQ; SF-12; work productivity and activity impairment questionnaire; Hepatitis and HIV evaluation Blood samples.

At inclusion: Hemoglobin, CRP, leucocytes, albumin, alkaline phosphatase, SGOT, SGPT, bilirubin, pancreatic amylase, creatinine, platelets, B12-vitamin, iron, ferritin and transferrin, 25-OH-D vitamin, transglutaminase. Obligatory tests, adult patients only: HBsAg, HBcore IgG (total), anti-HCV and anti-HIV. If possible, adult patients only: anti-HBs, HBcore IgM, HBeAg, anti-HBe, HBV-DNA (last quantitative measurement), anti-delta [anti-HDV], HCV-RNA (last quantitative measurement) and HCV genotype.

At each follow-up visit: Hemoglobin, CRP, leucocytes, albumin, alkaline phosphatase, SGOT, SGPT, bilirubin, pancreatic amylase, creatinine, platelets, B12-vitamin, iron, ferritin and transferrin; 25-OH-D vitamin at 6 and 12 month visit.

RESULTS

We observed the following results for the 9 month period January - September 2010 (Figure 2-4).

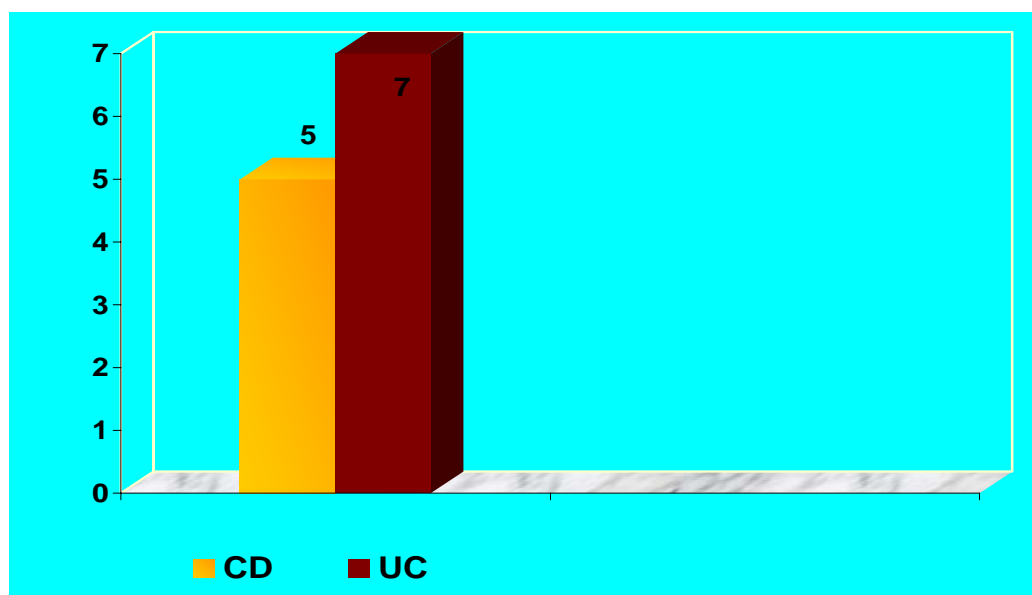


Figure 2. Timis county: distribution of the IBD types

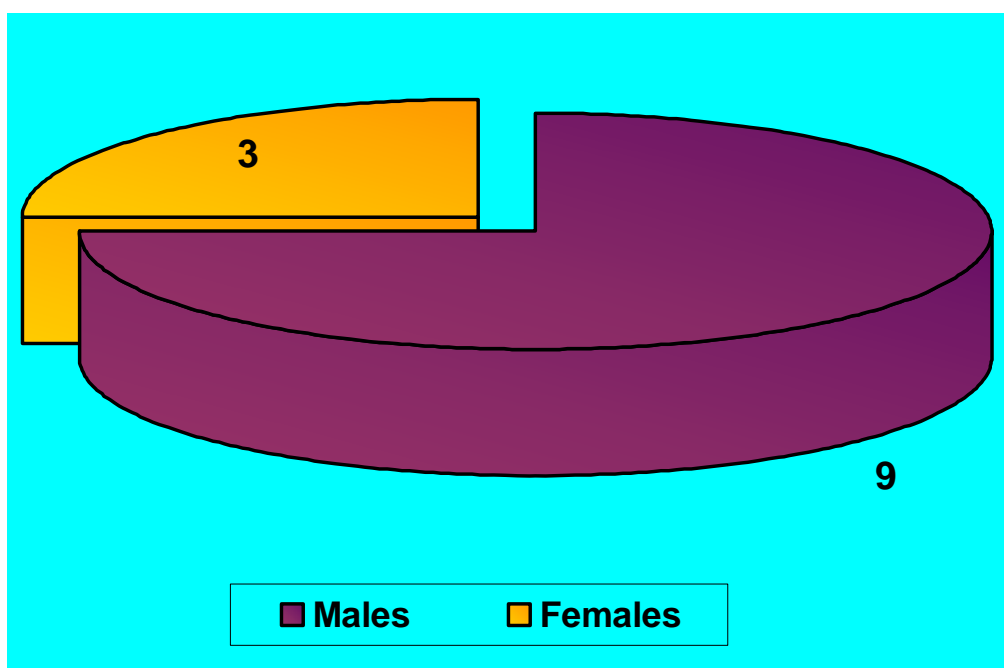


Figure 3. Timis county- IBD distribution according to gender

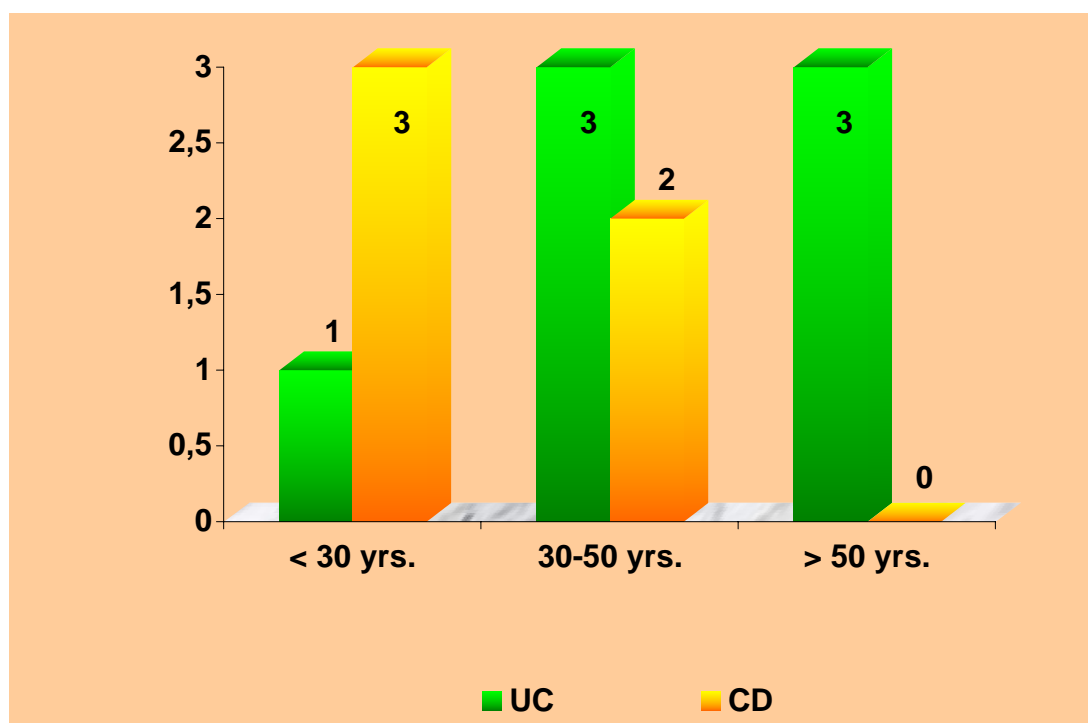


Figure 4. Timis county - IBD distribution according to age

Incidence of IBD

If the progression of inclusion will continue at the same rate, we expect to diagnose **29 cases of IBD/ 2010 → 4.36 new cases/100.000 inhabitants**

- 17 cases of UC/ 2010 → 2.56 new cases/100.000

- 12 cases of CD/ 2010 → 1.8 new cases /100.000

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CONCLUSION

This multicentric European study on IBD epidemiology will bring us a lot of new data about this disease. We will also have new data about the epidemiological trend in Western Romania.

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ENVIRONMENTAL FACTORS (NEGATIVE AIR IONS) WITH BENEFICIAL EFFECTS ON ANIMALS AND HUMANS

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REZUMAT

Aeroionii negativi (molecule sau atomi ai aerului care au pierdut sau câștigat un electron) sunt responsabili de un mare număr de efecte benefice pe sănătatea animală și umană. Ei pot fi găsiți atât în medii naturale, cât și în medii artificiale, folosind generatoarele de ioni. În lume, cele mai multe dintre efectele benefice au fost obținute cu ajutorul dozelor mari de ioni. În România, majoritatea cercetărilor experimentale au fost efectuate cu doze moderate de ioni, de cele mai multe ori, ioni negativi. Pentru a elucida unele aspecte metodologice referitoare la doza, perioada critică de aplicare și chiar mecanismul de acțiune, au fost efectuate mai multe studii pe oul de găină, pe animale de laborator și pe subiecți umani. Rezultatele arată că dozele moderate de ioni, în aplicare continuă, prelungită, ar putea avea efecte negative asupra dezvoltării ouălor de găină, deși în aplicare de scurtă durată sunt benefice. Dozele mari au o acțiune bipolară, depinzând de perioada de dezvoltare în care sunt aplicate. La oameni, ionii negativi și-ar putea exercita acțiunea prin restabilirea nivelului de beta-endorfine, care este dezechilibrat la persoanele cu sindrom premenstrual.

Cuvinte cheie: ionizare negativă, ouă, animale, sindrom premenstrual

ABSTRACT

Negative air ions (air molecules or atoms which have gained or lost electrons) are responsible for a great number of beneficial effects on animal and human health. They could be found in natural environments, as well as in artificially created indoors, using ions generators. Throughout the world, many of the effects were obtained with big doses of ions. In Romania, the majority of experimental researches were conducted using moderate concentrations of ions, mostly negatives. In order to elucidate some methodological aspects regarding the doses, the critical periods of application, and even the mechanism of action, many studies have been done on chicken eggs, laboratory animals and humans. The results show that the moderate concentrations in prolonged application could be detrimental to development, although in short treatment is beneficial. The large doses have a bipolar action depending on the period of development when they are applied. On humans, negative ions

might exert their action by restoring the levels of beta-endorphins, imbalanced during the Premenstrual Syndrome.

Keywords: *negative ionization, eggs, animals, premenstrual syndrome*

INTRODUCTION

Many people are aware of the wonderful feeling near a waterfall, or deep inside a forest. Starting with the antiquity, the benefic action of the outdoor air was already observed and the air therapy was widely recognized and recommended by the great doctors from that times. Nowadays, theoretically at least, nobody contests the favorable action of the clean air, although, practically, air prophylaxis and air therapy are not used according to their high value [1,2,22].

But what are the factors of clean air which determine this action, and why the stale indoor air loses its positive proprieties? Some specialists said that physical factors (temperature, humidity, air movement) are responsible, others said that chemical factors (oxygen and carbon dioxide) induce the benefic state, but their changes weren't so important to explain their differential biological action (to make the difference). After a while, the presence of a toxic principle was also implied. It seems that the answer was brought out by the discovery of the air electricity, more than 200 years ago, and by the possibility to measure its different forms [12,13,15,25,28].

Average people spend between 80-90% of their lives indoors (home, office, car), where many pollutants become concentrated and where most individuals are exposed to either ion depletion or a condition called „positive ions poisoning” (PIP).

During the 20-th century, the study of air ionization has engaged the thinking of many investigators but the many contradictory statements and publications have repeatedly discouraged and disrupted work in this field. In Romania the researches on air ionization started around the middle of the XX-th century by Prof. Salvator Cupcea MD, PhD,

who has proposed the air ionization as an indirect air pollution indicator. He has trained a great number of medical doctors, engineers, physicists, chemists and biologists and leaved us a great legacy. The one, who has dedicated his entire life to this domain of air ionization, was Prof. Mauriciu Deleanu, MD, PhD [17,18].

Ionization of the air is a natural phenomenon [15]. An ion is a molecule or a small group of molecules or atoms which has gained or lost an electron. If the atom loses an electron, it becomes positive, while the addition of an electron makes it a negative ion. These two small invisible electrified particles have an effect on our physical and mental well-being. The negative ions (“happy ions”, “good ions”, “vitamins of the air”) make us feel good and destroy harmful bacteria. The positive ions make us feel bad. Both of them are naturally produced indoor or outdoor. The factors producing air ions are terrestrial factors (radioactive substances, water spraying, evaporating water, lightning, thunder) and cosmic factors (cosmic rays, solar UV).

Normal natural concentrations of air ions (negative and positive) are pretty much similar with a slightly predominance of the positive ones: 200-800 negative ions/cubic centimeter (ccm) and 250-1500 positive ions/cmc. Normal ratio q (positive ions/negative ions) = 1.1–1.2. After production, indoors, ions “live” an average of 30 seconds before touching a surface and shorting to ground. Outdoor ions usually “live” several minutes more than indoor ions: 300 seconds over the sea, 50 seconds over the land, 20 seconds in a polluted air and few seconds in confined indoor [5,11,20,28].

Several hours before a storm, the positive ions concentration will increase

dramatically, sometimes exceeding 5000 ions/cm. During a storm, negative ions increase to several thousand, while positive ions decrease, often to levels below 500/cm. Hot objects usually emit equal number of negative and positive ions. Evaporating water will produce negative ions in the air and as a consequence leave positive charges behind in the water that hasn't yet evaporated. The city environment works to destroy negative ions: car fumes, air pollution, air heating system, smoking, even office buildings bring about an electrical imbalance, the consequence of which is having a direct effect on the health of people. The average city worker breathes less than 200 negative ions per cubic centimeter (ccm), whereas, clean country air has anything from 1-2,000 per ccm.

There are many situations when the concentration of ions can be greater than usually. Outdoor, big concentrations of negative air ions (NAI) are found: near a waterfall (Yosemite–100 000 ions/cm; Niagara); on the mountains tops covered by firs; near the mountains' rivers; at the sea shore (breaking surf of sea spray); after a spring time thunder/storm (trillions) and in humid vegetated areas. Indoor, a good source of negative ions is shower and water-works [11,13].

The positive air ions (PAI) are produced outdoor by friction between air and ground ("witches winds" like Santa Ana, Sharaw, Fohn, Sirrocco, Chinook, over-produce serotonin by as much as 1,000 times), air over metal (such as a car body), air over air (before a storm), air and the particles swept up and carried by it (on city streets). Indoor, positive air ions are found in dry, heated or air conditioned rooms and in confined spaces, i.e. offices where PC are used [21,23,25,26]. Synthetic clothes are also responsible of a great number of PAI [27]. Xerox also overproduces positive ions (6 fold more positive ions). The friction through vents (ducts) results in the loss of almost all the negative air ions and

generates an additional overload of positive ions. In confined spaces there is a condition named "Positive ion poisoning" (PIP), when the positive ions predominate and may completely replace the negative ions, producing unpleasant reactions due to serotonin release: tension, irritability, depression, palpitations, dyspnoea, migraine [15].

There are several theories to explain air ions action. One of them is the theory of lung/tissue electrical change: air ions are taken up by the respiratory tract and part of them reaches the lungs; as they are mostly ionized oxygen and water aerosols, they are taken up by the erythrocytes and thrombocytes at the alveoli site together with normal oxygen and water. The negative charges are transferred to plasma/erythrocyte colloidal proteins and that will enhance their colloidal stability, improving our blood circulation, stimulating our nervous system and endocrine organs [4].

Another theory is the neuro-reflex one: negative air ions influence the respiratory center and consequently the breath is calm, easily and tranquil, and the respiratory pause is longer [3].

The serotonin hypothesis [14,15] sustain that serotonin, a powerful neurohormone, could be affected by the polarity and concentration of air ions breathed. Negative ions act to reduce serotonin levels in the respiratory system, blood and brain, whilst positive ions increased serotonin levels. Negative air ionization appears to reduce serotonin via enhancement of monoamine oxidase activity. Serotonin (5-hydroxytryptamine or 5-HT) can produce neurovascular, endocrinal, and metabolic effects throughout the body. In the hypothalamus 5-HT participates in various processes such as sleep, the transmission of nerve impulses, and in our evaluation of mood. Reduced serotonin levels result in a mentally relaxed state and reduction in feelings of depression [24].

Nature provides a delicate balance of ions. The relatively low natural levels do not permit evaluation of their biologic properties. A different medium must be artificially created in laboratory and clinical experiments to permit such investigations. Only with help of ion generators capable of producing unipolar ions in controlled concentrations can this goal be achieved. In medicine, the main interest centers on the effect of artificially created and not natural ion levels. Of the many practicable methods of artificial ion generation, the foremost frequently utilized are radioactive isotopes, high voltage currents, ultraviolet radiation, and charged liquid aerosols. During the last years, many ion generators appeared on the market: ELANRA (Australia), MODULION® of Amcor-Amron (Herzliya, Israel), and GENION 03 (Romania). All supposedly produce only negative ions.

At the Department of Environmental Health Cluj-Napoca, the researches made for several decades have tried to study the effects of negative air ions (NAI) in different experimental conditions. The researches progressed from the chicken eggs, to the laboratory animals (rats) and, finally, to the human body [16-19].

MATERIALS AND METHODS

a) In the experiments made during the process of embryo-genesis and hatch of chickens were used different doses, different times of exposure and different periods of ontogenetic development. The purpose was to evaluate the role of moderate concentrations but in extended application, as well as the effect of large doses but in shorter exposure, and in different phases of the evolutionary process.

The experiment was developed in two phases. In the first phase, moderate doses of NAI were used (20.000 pairs of ions/ccm), applied all the time (24 hours daily), for all the period of incubation (21 days). In the second experiment were used very large

doses of NAI (180.000 pairs of ions/ccm), applied in the different phases of the incubation process: embryo genesis (days 1-6), organo-genesis (days 13-18 of incubation), or in the both critical phases of development, for 10 minutes per day.

b) Another set of experiments was conducted on laboratory animals (rats). The moderate air ionization (30,000-45,000 pairs of ions/ccm) was associated with some essential chemicals (Copper, Zinc) or toxic chemicals (Thyram). In the end, the hematological parameters were determined and histological preparations from the reproductive system were done.

c) On human beings, many experiments using moderate concentration of negative ions (17,000-30,000 ions/ccm) were conducted. It is well known that the PMS records a collapse of the beta-endorphins level in the organism and NAI could exert their effect by increasing the level of beta-endorphins in the body. A double-blind experiment was done on 29 female students; 21 of them were treated during 15-25 minute a day, for up to 21 days with 17,000 ions/ccm; 8 of them were the control group.

RESULTS

a) In the first study it appears that by continuous ionization in moderate concentration, the percentage of eggs with embryos until the 6th day was bigger than the witness batch. By continuing the exposure, unfavorable effects have occurred. At the end of incubation, a smaller percentage of normally hatched eggs was identified ($p < 0.01$). The percentage of hatched eggs with pathological phenomena (progressive paralysis) was three times higher at this batch. Moreover, the number of knocked but not hatched, and non-knocked and non-hatched eggs, with the embryos dead in different evolutionary stages, was bigger ($p < 0.01$).

The application of higher doses appeared to be beneficial in eggs development, but only

if the exposure was made in the second half of incubation, after the chickens development was finished.

b) The results on laboratory animals agree with the findings of leading ion researchers worldwide, that the NAI seems to moderate the reaction of the animals to these chemicals, the majority of the hematological parameters returning to the reference values. The histological preparations show that the organs of both sexes, modified under the influence of Zinc and Thyram, tend to return to the normal structure, when the negative air ionization was associated.

c) Many of researches made on human beings have been demonstrated that NAI have a normalizing effect on a lot of diseases (the more the disturbance, the best the effect of NAI), and a stimulating effect, increasing the physical and mental efficiency and the general resistance of the organism. Among the main results on students, the enhancement of the physical and mental efficiency could be noted. The benefic results are overwhelming on female students with Premenstrual Syndrome (PMS), under the moderate air ions therapy. On female students with PMS, the results were very significantly different from the witness group. The premenstrual intense pain decreased from 71% to 29% ($p < 0.001$), and generally pain completely disappeared in 45% of cases. Acne decreased from 76% to 43%, and irritability from 76% to 19%. It is worth mentioning that the premenstrual irritability completely disappeared in 75% of students. Before the experiment 81% of the cases used pain killers, while after the experiment only 24% were still addicted to medication, especially as a preventive measure. Another effect was the regulation of the menstrual cycle, in 89% of the cases with irregular periods. All of these improvements lasted in half of cases up to one year after the treatment (none known medicine has such a long effect). The items referring to the energetic basis of the neuro-psychic tonus have an ascending trend, except the well-being sensation and self-

confidence, which were situated from the very beginning at the higher levels of the scale.

CONCLUSIONS AND DISCUSSIONS

This is only a brief review of some areas of clinical research. The main limit is the small number of subjects. Based on the evidence surveyed in on paper, it appears that NAI therapy represents a promising branch of biological research.

There is hardly any other element of the physical environment which has caused so much confusion as ionized air and which created so much controversies. Despite the over 100 years of study, the knowledge on ion specter is still in an embryonic stage.

NAI have good or excellent results in many diseases (the greater the level of physical stress, the greater the effect ion treatment seemed to have, rebalancing the energetic state of the body). As a therapeutic factor, the negative air ions moderate, reduce or normalize many respiratory illnesses, cardio-vascular, digestive, neuro-psychic diseases, as well as burns (ionized air has analgesic properties and healing is often more rapid and complete). As a prophylactic factor, the negative air ions increase the physical and mental efficiency and performance; prevent some meteorology-sensitive diseases and increases the general resistance. The finding at LaTrobe University from Melbourne showed that exposure to NAI results in significant increases in the level of IgA-Immunoglobulin A, an important immune factor, effect immediate by the action on serotonin metabolism [29].

Several factors in the area of negative air ionization served to cloak the whole field in an aura of ambiguity: there isn't a standard procedure, there were used ions of both polarity, sometimes the doses were very high, the exposure was sometimes too long,

some devices were sold without emitting ions, or emitting O_3 or NO_x , we do not know the maximum and minimum doses of a favorable action and the interaction with other factors, temperature and relative humidity were not monitored, experimental subjects were not grounded (their external surfaces developed high electrostatic charges and in consequence, repelled ions [6]. Clinicians assessing the value of air ions as a therapeutic modality frequently committed all or some of the errors listed above and in addition, neglected to utilize the double blind cross over technique for ion administration [7]. In view of these omissions, it is not surprising that convincing proof of the role played by air ions as physiological mediators or as a therapeutic agent has been slow to emerge. Moreover, the effects of NAI therapy depend on many individual factors like individual tolerance, resistance/sensitivity to the atmospheric electricity, age (the very young, and the old are more sensitive), health status (those most severely stressed and those with compromised immune system), and sex (female are more responsive than males to negative-ion depletion or enrichment).

There are few contraindications for negative ions therapy: bronchial asthma, severe cardiac failure, hypertension, coronary artery diseases, and nasal mucous alteration [8].

In conclusion, it can be said that moderate doses of negative air ions could be indicated in a large specter of situations. They are not a universal panacea, but they could be considered a physiological factor, very cheap, with no side effects, not addictive, and which do not bring any foreign substance inside the organism [12].

Much work remains to be done before effective minimum and maximum dosages, i.e. number of ions per ccm of air are in a given period of time, are finally determined. Until then, any attempt to make ion generators directly accessible to the lay public without previous tests must be discouraged [27].

In the future, each unit should clearly state the density and quality of ions produced, and the public must be warned not to exceed the daily optimum of the inhalation prescribed. The increased tempo in research and widening of the circle of investigators, plus constructive criticism, should soon produce answers not yet available.

Considering the advantages, the artificially ionized air might be a potentially effective biologic factor, which, if properly harnessed, controlled, and utilized, may become a valuable adjunct to other forms of therapy. Even small and negative, NAI have positive effects.

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PERMANENT CENTRAL CATHETER – ALTERNATIVE TO HEMODIALYSIS BY ARTERIOVENOUS FISTULA

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REZUMAT

Cateterele centrale permanente montate prin abordul venei jugulare interne, subclaviculare sau femurale cu tunelizare subcutanată la nivelul toracelui sau coapsei, reprezintă o alternativă reală de hemodializă la pacienții cu imposibilitate de abord prin fistule arteriovenoase, sau la pacienții cu capital vascular impropriu efectuării unei fistule arteriovenoase eficiente. Studiul a fost efectuat pe o perioadă de 10 ani, timp în care s-au montat 180 de catetere în vena jugulară internă, 5 în vena subclaviculară și 15 în vena femurală. Posibilitatea hemodializei imediat postoperator și durata lungă de utilizare a cateterelor, face ca acest tip de abord să fie preferat unui cateter temporar montat în vena subclaviculară, jugulară internă sau femurală grevat de obstrucții venoase importante și precoce, în situațiile descrise mai sus.

Cuvinte cheie: cateter permanent central, tunelizare subcutanată, alternativă de hemodializă

ABSTRACT

Approach permanent central catheters fitted with internal jugular vein, subclavian vein or femoral vein, with subcutaneous tunneling to the chest or thigh, is a real alternative hemodialysis patients with arteriovenous fistulas prevented by the approach, or unfit patients with vascular making a capital efficient arteriovenous fistulas. The study was conducted over a period of 10 years, during which 180 catheters were installed in the internal jugular vein, 5 in subclavian vein and 15 in femoral vein. The possibility of immediate postoperative hemodialysis and longer catheter use, makes this type of approach to be preferable to a temporary catheter placed in the subclavian vein or internal jugular, affected by significant venous obstruction and early in the situations described above.

Keywords: permanent central catheter, subcutaneous tunneling, alternative hemodialysis

INTRODUCTION

Permanent central catheter is a hemodialysis access way be considered an exceptional case, namely tertiary access surgery, patients undergoing hemodialysis for many years, having reached exhaustion venous capital necessary [1,2]. Number of patients with long-term catheter must not be less than 10% of all patients in hemodialysis program. In fact, their number is much bigger and growing, because of problems with vascular arteriovenous fistula, or due to complications of temporary catheters, notably mounted in subclavian veins.

The causes who determine hemodialysis by central venous catheter are:

1. Exhaustion of venous capital respectively radio-cephalic arteriovenous fistula, brahio-cephalic, or brahiobazilic arteriovenous fistula [2].
2. Exhaustion of fistula with graft and synthetic prosthesis [2].
3. Impaired peripheral vessels, that brachial artery, radial artery, cephalic and basilic veins by vascular disease or other causes - arteritic patients, diabetics, which are unsuitable for carrying vessels of arteriovenous fistula [2].
4. Stenosis, occlusion or subclavian vein rapidly progressive fibrosis, secondary to temporary catheters fitted in those veins. Subclavian vein obstruction leads to inability to optimum efficiency of use of arteriovenous fistulas [2].

Permanent catheters are fitted with internal jugular approach, subclavian or femoral. In exceptional cases the approach is mounted translumbar, transhepatic, transrenal or transazygos [1,3,4].

OBJECTIVES

Installation of a permanent central catheter through the internal jugular approach,

subclavian or femoral with subcutaneous tunneling, for hemodialysis patients with chronic renal failure [1-4].

MATERIAL AND METHODS

The study was conducted over a period of 10 years, during which 180 catheters were placed via the internal jugular approach, 5 subclavian vein and 15 femoral vein, percutaneous or by denudation. Of these, 144 were first and 56 per mounted by changing old catheters (permanent or temporarily) with new ones. Type of catheters were used for long-term was Belco, Jolin, Medcomp or Pourchez. Installation was realized by puncturing the right internal jugular vein or subclavian vein, percutaneous or thru denudation and placing a catheter of long-term in superior cava vein to the right atrium. The same technique for the femoral vein thru the inferior cava vein. The catheter is fitted with subcutaneous tunneling in the right pectoral region or the femoral vein with the tunneling front of the thigh.

RESULTS

Immediate postoperative results were very good, with immediate use the catheters, namely hemodialysis. Postoperative complications were few, persistent bleeding in 5 catheters and which were performed local hemostasis, 1 case requiring to suture a flaw in the jugular vein with 6-0 monofilament thread. 10 cases had infection tunnel at about 3 months away, four cases were cracked and required their change in a period of 3-10 months. All catheters were implanted properly, with immediate verification of radiological examinations, in three cases and echocardiography was performed, due to mounting suspicions right ventricle, subsequently overruled (Figures 1-4).



Figure 1. Highlights for mounting the jugular vein



Figure 2. Permanent catheter placed in the central internal jugular vein - tunneling



Figure 3. The final aspect of the permanent internal jugular catheter

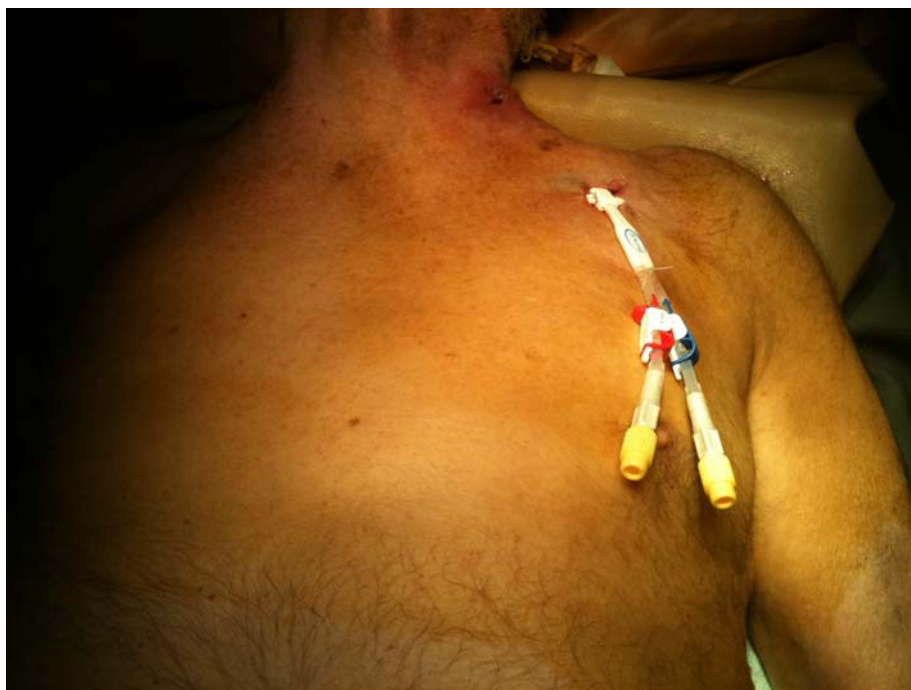


Figure 4. Permanent catheter placed in the subclavian vein

CONCLUSIONS

Permanent central catheters fitted with approach of internal jugular or subclavian vein with subcutaneous tunneling to the chest, femoral vein and fitted with the tunneling front of the thigh is a real alternative for hemodialysis patients with arteriovenous fistulas prevented by the approach, or vascular patients unfit to carry

out a capital efficient arteriovenous fistulas. The possibility of immediate postoperative hemodialysis and long use of catheters, an average of 18 months makes this type of approach to be preferable to a temporary catheter placed in the subclavian vein or internal jugular, affected by significant venous obstruction and early in the situations described above.

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Show the importance of the approached theme. Clearly state the aim, objective or research hypothesis. Only make strictly pertinent statements and do not include data or conclusions of the presented paper.

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