

Consumption of the mineral water reduces activity of inflammatory process in the gastroduodenal mucous membrane, improves digestion, and normalises gastrointestinal motility and the pancreas exocrine function.

We invited the patients for refresher course of treatment in one year time and they confirmed the treatment effect maintained for 6-8 month they lived without attacks.

Conclusion. Protracted treatment with AMW improves exocrine function of the pancreas, reduces major clinical symptoms of chronic pancreatitis, thus resulting in better life quality of patients.

Clinical and functional parameters of the pancreas show effect of the treatment maintaining for 6-8 months.

Positive therapeutic effect requires strict keeping to the intake schedule and dosage, along with allowing 3-day period for an organism adapting to the mineral water and the course continuing for at least 24-28 days. Refresher courses of water drinking treatment at 5-6 month intervals help to consolidate the treatment effect achieved.

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The element status and adaptation level of the Far North inhabitants

LLC «Gazprom Transgas Yugorsk» sanatorium of Yugorsk

Lekhanova E.N. – physician, candidate of medical science

Summary: Results of one-stage researches of Yamal unorganized inhabitants aged 20-59 are presented. Influence of chemical elements on adaptation level of northerners to severe conditions of the Far North was investigated. The chemical elements influencing decrease of adaptable processes were defined. Dynamics of concentration Fe, Mn, Zn, Co, Ca changes was studied taking into account adaptedness level.

Key words: chemical elements, unorganized population, the Far North, adaptation level.

Introduction. During the evolution period organisms adapted for a certain chemical compound of environment. The geochemical factors of environment play an important role in formation of ecological adaptedness of a human body in severe conditions of the North. Landscape-geochemical features of the Far North are characterized by the insufficient maintenance of macrocells in potable water, parity change between essential microcells that can become the reason of development of some pathologies at inhabitants of the Far North. Today ecologically dependent pathology of high latitude is considered to be microelements significantly

influencing the course of the northerners' adaptation processes causing the development of pathologic processes in a human organism [2, 11]. The chemical elements exchange between outside and inner environments is known to be systematically important factor of homeostasis [2, 4, 10-12]. Concerning this, one of the most important human ecological problems is the study of element status influence on adaptation of the Far North employable inhabitants.

Our goal was to study the chemical elements concentration influence on the adaptation of the unorganized inhabitants aged 20-59 in Yamalo-Nenetskiy Autonomous Region.

Materials and Methods. We did the one-stage populated research among unorganized inhabitants aged 20-59 of both sexes in Yamalo-Nenetskiy Autonomous Region (YNAR). Selection was random. 78% of inhabitants were involved in the research. The total number of the examined people was 1511. The average age of them was $40,7 \pm 12,9$. Job experience in the North of people from other regions was $- 23,3 \pm 14,2$ years.

Research protocol consisted of anthropometry, office measurement of systolic (SBP) and diastolic blood pressure (DBP) with the Korotkov's method, calculation of heart rate (HR), hair selection from occipital part of the head.

The estimation of the blood circulation system functioning level according to an index of functional changes (IFC) at its simplicity provides the system approach to the solution of quantitative measurement of adaptable possibilities of an organism. IFC calculation was made by the mathematical model:

$$IFC = 0,011 \cdot HR + 0,014 \cdot SBP + 0,008 \cdot DBP + 0,014 \cdot B + 0,009 \cdot MT - 0,009 \cdot P - 0,27 \quad (6),$$

where HR – pulse rate, systolic SBP and diastolic DBP blood pressure, B – age, MT – a body weight, P – height.

The estimation of adaptable possibilities was defined on following ranges: up to 2,59 points – satisfactory adaptation, from 2,6 to 3,09 points – pressure of adaptation mechanisms, from 3,10 to 3,49 points – unsatisfactory adaptation, above 3,5 – adaptation failure [1].

According to modern views, the hair element structure is better than other bio-indicator environments reflects the influence on a person, as complex of chemical elements, and physiological requirement for them. Chemical elements (Fe, Zn, Cu, Mn, Ni, Co, Cd, Pb and Ca) in hair were identified with use of the modern analytical equipment based on principles of nuclear absorption «Spectr AA-50F» of the company "Varian" (Australia) according to the methodical recommendations [9]. Results were compared with the regional standard indicators [7].

The statistical analysis was performed with the program "Statistica-6". As the distribution of random numbers in most cases differed from normal, the median was served as the measurement

of the central tendency, distributions – inter-quartile range. Comparisons of three independent groups were done with the Kruskal - Wallis method. Pair comparisons were performed by the Mann-Whitney method and χ^2 . The analysis of the features interrelation was calculated with the Spirmen rank correlation factor (r_s) and the tetrachoric correlation factor. The contribution of feature influence was defined on phi (ϕ). The values were considered statistically significant at $p < 0,05$ [11].

Results and discussion. In the adaptation structure of the surveyed population to environment conditions persons with satisfactory adaptation (39,2 %) and pressure of adaptation mechanisms (29,3 %) prevail, further there are persons with unsatisfactory adaptation (16,4 %) and adaptation failure (15,1 %).

The analysis of the chemical elements concentration taking into account adaptation level is presented in the Tabl.1. The element status at satisfactory and unsatisfactory adaptation is characterized by deficiency of calcium, cobalt, cadmium and lead. The element status at pressure of adaptation mechanisms and its failure is characterized by nickel excess, in combination with calcium, cobalt, cadmium and lead deficiencies.

Table 1

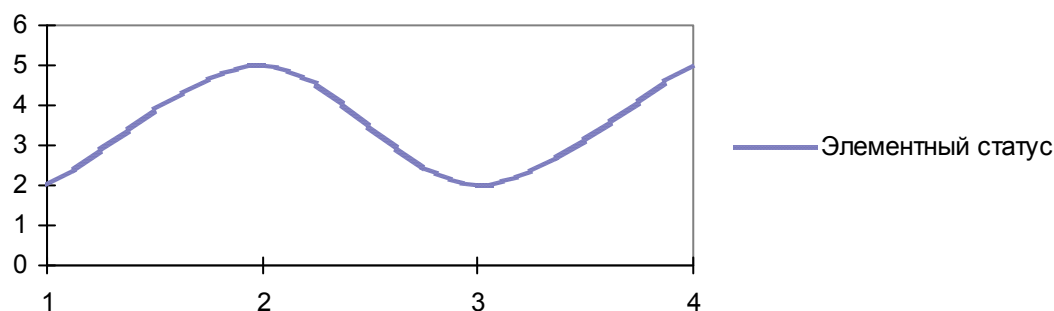
Chemical elements concentration at YNAR inhabitants
aged 20-59 years taking into account the adaptation level

hE, mkg/ g	C	Functional changes index												Kruskel- Wallis ANOVA	
		1, n=593			2, n=443			3, n=247			4, n=228				
	%	2	5	7	2	5	7	2	5	7	2	5	7	H	p
n	Z	8 4,18	11 9,00	14 1,00	8 0,00	10 8,30	14 0,00	7 8,46	9 6,00	12 8,00	7 1,00	9 8,15	12 5,00	3 4,55	0, 000
u	C	2, 70	4, 68	7, 70	2, 70	4, 00	7, 00	2, 80	4, 00	6, 00	2, 80	4, 00	6, 85	5, 67	0, 129
e	F	1 3,00	16 ,50	23 ,00	1 0,50	15 ,00	20 ,00	1 1,40	1 5,00	19 ,60	1 1,00	1 4,50	20 ,00	2 1,15	0, 000
n	M	0, 66	1, 00	1, 90	0, 60	0, 90	1, 50	0, 66	1, 00	1, 70	0, 60	0, 90	1, 48	7, 83	0, 049
i	N	0, 00	0, 10	0, 50	0, 00	0, 10	0, 55	0, 00	0, 00	0, 60	0, 00	0, 01	0, 68	0, 05	0, 990
o	C	0, 00	0, 01	0, 45	0, 00	0, 01	0, 23	0, 00	0, 01	0, 20	0, 00	0, 00	0, 18	1 1,16	0, 011
d	C	0, 00	0, 06	0, 11	0, 00	0, 05	0, 10	0, 00	0, 01	0, 14	0, 00	0, 00	0, 15	5, 76	0, 124
b	P	0, 00	0, 00	0, 01	0, 00	0, 00	0, 10	0, 00	0, 00	0, 10	0, 00	0, 00	0, 10	1 1,76	0, 008

a	C	7	81	97	7	77	88	7	7	78	7	7	77	4	0,
		6,90	,00	,00	5,00	,00	,00	2,00	6,90	,00	0,00	6,00	,00	2,19	000
C	Э	↓Co, Cd, Pb, Ca			↑Ni↓Co, Cd, Pb, Ca			↓Co, Cd, Pb, Ca			↑Ni↓Co, Cd, Pb, Ca				

Note: 1 – satisfactory adaptation, 2 - with pressure of adaptation mechanisms,
3 – unsatisfactory adaptation, 4 – adaptation failure.

It is necessary to consider that in the YNAR territory there is the high content of Fe (23MCL) and Mn (6 maximum concentration limits) in water [7,8] . Besides, the element structure of environment in area changes at the expense of technogenic influence of oil and gas industry. Oil is typically characterized by the presence of such elements as V and Ni in it. All components of oil can be contained in sheeted water and, accordingly, there is a probability of their receipt in fresh underground waters located above [9]. Proceeding from the aforesaid, the element status of the inhabitants from the specified chemical elements is influenced only by technogenic Ni. If to consider that first two groups on IFC belong to health according to nosological classification, and the other two - to illness, then "healthy" individuals have excessive concentration of Ni with the pressure of adaptation mechanisms, and "patients" - with decompensation of pathological process. As a whole, qualitative changes of the element status occur wavy (fig. 1).



Notes: 1 – satisfactory adaptation, 2 - with pressure of adaptation mechanisms,
3 – unsatisfactory adaptation, 4 – adaptation failure.

Fig.1. Dynamics of the element status qualitative changes at unorganized employable inhabitants of Yamalo-Nenetskiy Autonomous Region

However, despite the identical qualitative changes of the element status at various levels of adaptation, essential quantitative distinctions have been found.

Individuals with pressure of adaptation mechanisms have the concentration of Fe in 10,0 % (U=113168,0, z=3,81, p = 0,0001, Mann-Whitney), Co in 2 times (U=121297,5, z=2,11, p = 0,03, Mann-Whitney), Ca in 5,2 % (U=21587,5, z=2,55, p=0,01, Mann-Whitney) lower than

individuals with satisfactory adaptation. The correlation analysis revealed weak connections between prevalence of Fe, Co deficiency and prevalence of pressure of adaptation mechanisms ($r=0,15$, $\chi^2=7,07$, $p=0,007$ and $r=0,16$, $\chi^2=8,95$, $p=0,003$, accordingly). The contribution of Fe deficiency to formation of pressure of adaptation mechanisms made 9,0 % ($\phi =0,09$, $p=0,01$), and deficiency Co – 10,0 % ($\phi =0,10$, $p=0,003$). Hence, in unorganized population of Yamal Fe accumulation is lower within the limits of regional range combined with the increase of Co and Ca deficiencies in transition from satisfactory adaptation to the pressure of adaptation mechanisms.

At the overstrain of adaptation mechanisms the Fe concentration decreases in 10,0 % ($U=63073,00$ $z = -3,17$, $p = 0,001$, Mann-Whitney), Zn in 23,6 % ($U=58372,50$, $z = -4,63$, $p=0,000$, Mann-Whitney), Co in 2,3 times ($U=66515,50$, $z = -2,09$, $p=0,04$, Mann-Whitney) and Ca in 5,3 % ($U=9544,50$, $z = -3,79$, $p=0,0001$, Mann-Whitney) compared with indicators at satisfactory adaptation. The correlation analysis identified a number of interrelations: weak force between prevalence of Co deficiency and overstrain of adaptation mechanisms ($r=0,24$, $\chi^2=13,29$, $p=0,0003$), Zn excess and an overstrain of adaptation mechanisms ($r = -0,25$, $\chi^2=13,28$, $p=0,0003$). The contribution of Co deficiency to overstrain development of adaptation mechanisms made 14,0 % ($\phi =0,14$, $p=0,0003$). So, the overstrain of adaptation mechanisms is characterized by smaller Fe and Zn accumulation within the limits of regional range in comparison with satisfactory adaptation combined with deepening of Co and Ca deficiency.

Individuals with adaptation failure have lower concentrations: Zn in 21,4% ($U=53445,00$, $z=-4,65$, $p=0,000$, Mann-Whitney), Fe in 13,7% ($U=57892,00$, $z=-4,65$, $p=0,001$, Mann-Whitney), Mn in 11,1% ($U=60434,00$, $z=-2,35$, $p=0,02$, Mann-Whitney), Co in 2,5 times ($U=59421,50$, $z=-2,68$, $p=0,007$, Mann-Whitney), Ca in 6,6% ($U=9346,00$, $z=-5,89$, $p=0,000$, Mann-Whitney), comparing the individuals with satisfactory adaptation. Correlation analysis identified a number of interrelations: weak force between prevalence of Co deficiency and adaptation failure ($r=0,19$, $\chi^2=9,05$, $p=0,002$), moderate force between Ca deficiency and adaptation failure ($r=0,33$, $\chi^2=7,35$, $p=0,007$). Contribution of Co and Ca deficiencies to the adaptation failure development made 11,0% ($\phi=0,11$, $p=0,002$) and 13,% ($\phi=0,13$, $p=0,01$) accordingly. So, the overstrain of adaptation mechanisms is characterized by smaller Fe, Mn and Zn accumulations within the limits of regional range in comparison with satisfactory adaptation combined with deepening of Co and Ca deficiency.

Further analysis of chemical elements interaction was carried out taking into account adaptation level (Tabl. 2). Interaction force increases between concentration Zn and Co with decrease in adaptation level that, probably, is connected with the decrease in Zn accumulation.

As a whole, individuals with satisfactory adaptation have the maximum quantity of interrelations between chemical elements. It partially confirms R.M.Baevsky's hypothesis that health is "various", and illness is of "one-face"[1].

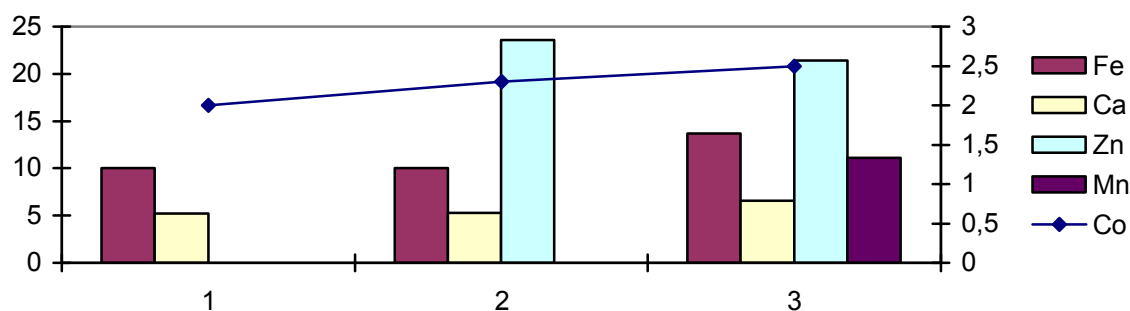
Table 2

Chemical elements interaction at inhabitants YNAR
aged 20-59 taking into account adaptation level

ChE mg/kg/g	Functional changes index											
	1, n=593			2, n=443			3, n=247			4, n=228		
	r _s	t	p	r _s	t	p	r _s	t	p	r _s	t	p
Zn & Cu	0,52	1,481	0,000	0,54	3,38	0,000	0,60	1,81	0,000	0,64	2,54	0,000
Cu & Zn	0,52	1,481	0,000	0,54	3,38	0,000	0,60	1,81	0,000	0,64	2,54	0,000
Mn & Ca	0,45	8,83	0,000	-	-	-	-	-	-	-	-	-
Ca & Mn	0,45	8,83	0,000	-	-	-	-	-	-	-	-	-

Notes: 1 – satisfactory adaptation, 2 - with pressure of adaptation mechanisms,
3 – unsatisfactory adaptation, 4 – adaptation failure.

The analysis of chemical elements concentration dynamics concerning indicators at individuals with satisfactory adaptation identified a number of laws (fig. 2). With reduction of adaptation level the depth of decrease in Fe concentration increases in organisms of northerners within the limits of regional range. Individuals with to satisfactory adaptation having initial Co and Ca deficiencies have deepening of the given chemical elements deficiencies when the adaptation level decreases. Decrease in Zn concentration was identified only at low adaptation levels within the limits of regional range. Decrease in Mn concentration within the limits of regional range was defined only at adaptation failure.



Notes: 1 – satisfactory adaptation, 2 - with pressure of adaptation mechanisms,
3 – unsatisfactory adaptation, 4 – adaptation failure.

Fig. 2. Quantitative changes dynamics of chemical elements concentration considering adaptation level of unorganized employable population YNAR.

Hence, the greatest quantitative changes in the element status of northerners were found at adaptation failure, then at pressure of adaptation mechanisms.

The research results allow to make the following conclusions:

- adaptation level of the Far North inhabitants is influenced by Fe, Co, Ca, Zn, Mn concentration;
- Ca deficiency has direct impact on the decrease of adaptation level;
- excessive Ni accumulation was identified at pressure of adaptation mechanisms and adaptation failure;
- the research results could be useful at planning of preventive actions concerning microelements in the Far North and in the territories equal to them.

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URSODEOXYCHOLIC ACID IN COMPLEX TREATMENT OF PATIENTS WITH METABOLIC SYNDROME

Tanchenko O.A., Naryshkina S.V.

Amur State Medical Academy, Blagoveshchensk

Summary

The aim of the investigation. The estimation of the degree of ursodeoxycholic acid's influence on values of immunoreactive insulin, leptin, clinically-biochemical indices in metabolic syndrome.

Materials and methods. Patients with metabolic syndrome (66 persons) at the age of 38 to 67 years who got ursodeoxycholic acid in complex treatment were examined. 21 persons made up the control group. The indices of immunoreactive insulin, leptin were studied in dynamics with the use of immunoenzymatic method, the values of lipid spectrum, the data of ultrasound investigation of liver were determined.

The results of the investigation. The reliable dynamics on the part of indices of cholestatic and cytolytic syndromes was marked in patients with metabolic syndrome who got ursodeoxycholic acid against a background of conventional therapy during 8 weeks in daily dose 15 mg/kg of the weight. The use of ursodeoxycholic acid favors the decrease of hyperinsulinemia, the level of leptin, leads to a considerable decrease of indices of common cholecterol, triglycerides, the index of atherogenesis.

Conclusions. Inclusion of ursodeoxycholic acid into the complex treatment of patients with metabolic syndrome leads to the decrease of indices of immunoreactive insulin, leptin, atherogenic fractions of lipids playing a leading role in the development and progressing of metabolic syndrome.