Materials of Conferences

REGRESSION MODEL OF ADDICTION THE ENVIRONMENT AND HEALTH OF ADULT IN URBAN AREAS OF KAZAKHSTAN

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Regression models of based functional state of the adult contingent on environmental factors urbanized territory of the Republic of Kazakhstan are presented in the article. High sensitivity to the metal content in the air, in the water and climatic factors (including the seasonality of the year) is showed.

Environmental factors play a significant role in the health of the population as a whole and especially in different age groups as separate groups and categories of people have different sensitivity to adverse factors and the role of the same factors varies significantly. Structural and functional changes with age are degenerative in nature and toxic substances found in the environment and in the workplace, would be more dangerous for the elderly, and the sensitivity to the effects of carcinogens may also vary with age [1].

Increased sensitivity to chemical agents are trying to explain age-related changes in pharmacokinetics and pharmacodynamics. For example, the skin absorption of chemicals increases with age. Physiological changes, such as reduced blood flow to the kidneys and liver of elderly people may lead to changes in the distribution and excretion of chemicals.

In the urban environment to the major risk factors for the health of the population, most researchers include chemical pollutants entering the storage medium – air swimming pool, snow, soil [2]. The priority pollutants often noted heavy metals, dioxins, polynuclear aromatics, chemical carcinogens (asbestos, nickel, benzene, arsenic, radon, carbon black, etc.) [3]. And air pollution is often a leading indicator of trouble hygienic areas [4, 5].

The aim of this study is to assess the impact of environmental factors in urban areas on the health of the adult contingent of the Republic of Kazakhstan.

Materials and methods. The study involved in the scientific and technical program of the *Ministry of Health of the Republic of Kazakhstan* on the theme: «The influence of environmental factors on the health of the population in urban areas» (2010–2012). 3982 people were surveyed of 6 Kazakhstan regions, with developed industries (ferrous and non-ferrous metallurgy, phosphoric Province, uranium, oil and gas regions of the Republic of Kazakhstan). Contingent divide by gender: men – 1954 (the average age of $39,2 \pm 0,47$ years) and women – 2,028 people (the average age of $41,5 \pm 0,24$ years). Statistical Database included indicators of the cardiovascular system and settlement of biological age. To establish the link between environmental parameters and integral indicators donosological condition of the body was a correlation analysis. Statistical processing was carried out using statistical methods package «Statistica», version 5.5. We conducted a regression analysis with the calculation of the regression coefficients (R). There has been a model of the level of statistical significance $p < 0,05$ and the coefficient of determination (R_2) greater than 70 %. Normality of distribution was determined by the residual histogram.

Results and discussion. Construction of the model and calculation of dependency indicators CSS showed that meteorological factors to the environment and are sensitive indicators of PARS IN entire sample surveyed adults, especially PARS to the parameters of the wind direction ($R = 0,85$, $R_2 = 0,72$) and the index ID to the state of humidity in the warm season ($R = 0,67$, $R_2 = 0,46$).

Gender feature to show more sensitivity to the predictor integral index of homeostasis (AP $R = 0,62$, $R_2 = 0,38$) to the sympathetic activity in the circuit structure of the regulation of heart rate in men during the cold season (MI $R = 0,63$, $R_2 = 0,39$) for enhancing and changing the direction of the wind (ID $R = 0,59$, $R_2 = 0,35$).

Assessment of the dependence of the rate of aging adult contingent of meteorological factors showed that there is great sensitivity in men. Thus, aging is much faster when they change the amount of moisture in the cold season ($R = 0,63$, $R_2 = 0,39$) and the change in wind direction ($R = 0,73$, $R_2 = 0,53$).

Score predictor sensitivity metal content of suspended dust revealed that it is more sensitive to the circulatory system (ID) and the integral index homeostasis (AP) in women 3 to substances such as lead (Pb), manganese (Mn) and copper Cu). As can be seen, lead (Pb) manifests itself more in the cold period of the year in 55 % of the surveyed sample ($R = 0,74$), and copper (Cu) mainly in the warm season, more than 86 % of the sample ($R = 0,73$).

Sensitivity to harmful substances contained in the soil, we have found according to, for both men and women. They showed for the integrated indicators CCC (PARS, IN), the integral index of homeostasis (AP) as well as to the terms of the rate of aging (TC).

The men figure PARS was sensitive to such substances as manganese (Mn, $R = 0,83$, $R_2 = 0,69$), in

the warm period to nitrates (R = 0,99, R_2 = 0,99), the cold period to Hg (R = 0,83, R_2 = 0,69).

The indicator of homeostasis (AP) was predictive of the sensitivity of the warm period to xylene (R = 0,92, R2 = 0,84), and sympathetic heart rate circuit responsive to the content of toluene (R = 0,61, R_2 = 0,37) more than in the cold season.

Aging Temp more responsive to 6 elements be it to cadmium (R = 0,97, R_2 = 0,94), zinc (R = 0,79, R2 = 0,64), cobalt (R = 0,97, R2 = 0,94) selenium (R = 0,97, R_2 = 0,94) and xylene (R = 0,77, R2 = 0,59).

In relation to the sensitivity of women to the content of harmful substances in the soil we have revealed the dependence of regression models to the 3 indicators to the index of this activity of regulatory systems (PARS), a combined indicator of homeostasis (AP) and the rate of aging (TC).

This was five substances, among them carcinogenic substances actions lead (R = 0,77, R_2 = 0,59), nickel (R = 0,96, R_2 = 0,92); nekantserogeny substance: zinc (R = 0,75, R_2 = 0,56), Hg (R = 0,86, R_2 = 0,74). It should be noted that the dependence of these substances have both warm and cold periods in the year.

Depending on the water regression were detected only in the indicators and PARS ID, as shown in Table was the third material, including nitrates (R = 0,98, R_2 = 0,96), selenium (R = 0,64, R_2 = 0,41) and Ti (R = 0,69, R_2 = 0,48).

On the content of substances in the air sensitive were all integral factors in both men and women, which confirm the priority of this factor in the adverse effect of exposure.

In the warm season it was dust (R = 0,66, R_2 = 0,43) and phenol (R = 0,76, R_2 = 0,57), which responds PARS component and an integral component homeostasis (AP) , but it responds to the content of other substances, such as cobalt (R = 0,58, R_2 = 0,34).

Both men and women were equally sensitive to the content of SO_2 in the cold season, which dependence manifested in 76 % of the sample (R_2 = 0,57).

As part of air pollutants, namely cobalt showed sensitivity index «rate of aging» in women, and this was expressed in the warm season.

Thus, depending on the functional state of the identified adult contingent living in urban areas of Kazakhstan with the levels and concentrations of pollutants in ambient factors indicative of their adverse effects this is greatly reduced by their adaptive capacity. The low level of plasticity of the body, namely the intensity of the central circuits in conjunction with the adverse effects of heavy metals on the generative system of the body greatly accelerates the rate of aging, especially in the female population.

References

1. Revitch B. Location of environmental factors among the external causes of death among the population of Russia // Hygiene and sanitation. – 2006. – № 5. – P. 95–98.

2. Stepanova N. The possibility of using snow-chemical shooting practice of Sanitary and Epidemiological Inspectorate // Human health and the environment. – 2003. – № 1 (118). – P. 31–34.

3. Grebnyak N., Fedorenko A., Yakimova A. and other atmospheric pollution as a risk factor for the health of the child and adolescent population // Hygiene and sanitation. – 2002. – № 2. – P. 21–23.

4. Pinigin M. Hygiene problems of air and solutions in the near future // Hygiene and sanitation. – 2000. – № 1. – P. 3–8.

5. Beketov A. Assessment of risk to human health from urban air pollution // Health Officer. – 2010. – № 6. – P. 40–41.

ISOLATION AND STUDY OF LACTIC ACID BACTERIA CULTURES, YEAST OF NATURAL COOKING KUMIS STARTER FOR THE GOAT'S MILK

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This article describes the microflora kumys made from fermented mare's milk and goat's milk. Isolated strains of lactic acid bacteria aerobic 3 – 1Sh; 2Sh; 3Sh; 4 anaerobic – 4Sh; 5Sh; 6Sh; 7Sh; 2-yeast culture-1Shd, 2Shd. In these cultures studied morphological, physiological, cultural and antagonistic properties on Bacillus mezentericus is defined acid-forming activity in the mare's milk Made a starter for kumys cultures of lactic acid bacteria and yeast in the ratio of 1:1:1 (bacillus, cocci, yeasts). Selected cultures to increase the collection of microorganisms and their use as starter cultures.

People use the milk for about 6 thousand years and lactic drinks in person`s life are particularly important. Since ancient times people widely use goat`s, cow`s, mare`s, camel`s milk. There are process of mixed fermentation in the most of lactic products – in lactic and alcohol.

Nomadic people (Kazakh, Kyrgyz, Mongols, Bashkirs, Tatars) since ancient times prepared kumis from mare`s milk.

In some nations kumis called differently: for example, the Arab people called the kumis as «al-laban-arramaki», and the Turkish people called it as «kumis».

Kumis – it is the dairy drink, which has leaven in mare`s milk, makes from lactic acid bacteries and yeast. The method of preparing kumis were well-known for ancient Scythian. In V th century to our era Herodotus wrote «the Scythian make the kumis from mare`s milk». The Scythians fermented mare's milk in wooden vessels. According to Herodotus – the recipe of the drink Scythians kept secret. The first written mention of the preparation kumis,