

## TEMP OF AGEING OF WORKER OF RISK GROUP IN CHROME INDUSTRY AND MEASURES OF ITS PROPHYLAXIS

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Here are presented the results of research of biological age of workers (male) in poor conditions of labor in chrome industry. Professional groups are defined, which are characterized with early ageing and increased risk of health violation. The measures are proposed for decreasing of temp of ageing among professional groups.

**Keywords:** worker of risk group, chrome industry, prophylaxis

Biological age (BA) is an integrated expression of age pathology, hidden or manifestative as adiaagnostic diseases. Chronological age (CA) is a convenient measure for evaluation of possibility of functional abilities of human and his ill health; however, it is not an ideal measure in connection with significant individual variability of human ageing. Existing data show, that there are definite static connections between the temp of ageing and number of social and hygienic factors, which can be defined subject to exact situation of human being.

Depending to the methods of definition, BA can reflect the decreasing of functional abilities of organism and its working ability (functional age) or decreasing of working ability of organism (gerontological age) [1].

Data in existing literature show, that biological age is an adequate indicator of functional condition of human, effectiveness of his professional activity, health condition, and the fact that there is close correlation of BA with conditions of labor activity, labor environment (chemical, thermal microclimate, noise, vibration, electromagnetic emanation and etc.).

Level of influence is mainly defined with professional sphere, type of works, chronological age, work experience, etc, which significantly influence the decreasing of adaptation reserves.

Problem of evaluation of BA is closely connected with the concept of physiological (normal) and pathological (early) ageing. This defines its significance subject to the solving of a great number of problems, including preventive, with taking into consideration of the fact that the conditions of labor activity influence greatly the BA.

Prediction of BA of workers of risk group upon the base of definition of its interrelation with such indications as CA, work experience, professional belonging, is very important from the position of development of adequate preventive measures.

The aim of the work is the evaluation of temp of ageing among the workers of risk group in chrome industry.

### Materials and methods of research

For calculation of biological age (BA) the registration of arterial pressure, static balancing (SB), frequency of breathing (FB), questionnaire survey with subjective evaluation of health (SEH) [3].

Indicator of BA is defined according to the formula:

$$BA = 26,985 + 0,215 - A\text{ДC} - 0,149 - 3\text{ДB} - 0,151 - SB + 0,723 - SEH. (1)$$

Then, individual amount BA was compared with proper biological age (PBA), which characterized the population standard of ageing temp. It was calculated according to the formula:

$$PBA = 0,629 - CA + 18,56. (2)$$

Total amount of examined workers – 106,75 of them were from risk group and 31 persons from control group. Risk group was presented by the following professions: furnaceman, crusher operator, crane operator, fireman, crusher, doser, burner. Control group was composed of engineering and technical staff.

Examination of normalcy of distribution of measured variates was executed with the help of Shapiro-Wilk test [4].

### Results of research and their discussion

Analysis of individual values showed, that average value of BA subject to professions amounts  $56,5 \pm 1,2$  years, at that proper biological age (PBA) amounts  $45,5 \pm 1,6$  years with the difference in  $5,36 \pm 1,4$  years.

Among all the professions, maximal values of BA were registered among dosers, crushers and firemen. In average, difference with proper level amounts 2,6 to 7,9 years between professions. At that, among the professions «crane operator» and «doser» difference in ranges was 7,9 and 6,1 years, which showed the expressiveness of heightened rate of ageing among these professions. Small difference was found between the values BA and PBA among the profession «crusher». In whole, the information shows that additional biological age among all professional groups was higher than values  $44,2 \pm 1,9$  years, in control group it was some lower and corresponded the value  $42,9 \pm 1,2$ .

In whole, comparative analysis of values of BA with indications of temp of ageing showed, that among such professions as furnaceman,

doser and fireman there is found «slightly early aged» temp, i.e. values BA-PBA are in the ranges +5 to +10 years, and the temp will increase with the growth of chronological age and work experience under harmful conditions. Values of examined master sample (72 people), show, that average value of BA of workers, equal to  $56,5 \pm 1,2$  years at proper biological age (PBA) amounts among the examined group  $45,5 \pm 1,6$  years with excess of PBA on  $5,36 \pm 1,4$  years (at average work experience higher than 16 years). It means, that ageing of workers of risk group in chrome industry is higher in comparison with population standard of ageing.

Diagnosed early temp of ageing in three professional groups, which work under the harmful conditions in majority of cases, will be expressed with violations in the health state, indicator of which is the growth of number of chronic diseases and general diseases with temporary disablement.

For prevention and decreasing of temp of ageing in this sphere the following measures are recommended:

- In execution of professional casting and professional examination in profession of risk group, it is recommended to consider the found tendency of ageing temp, and, in particular, follow the age limits;
- Medical preventive measures in found professional groups claim for additional programs for increasing of their labor ability and correction of status with usage of antioxidants (vitamins C, E, rutin) and application of different geroprotectors;

- Prophylaxis of postprimary chronic diseases, especially those of lungs as the consequences of smoking and harmful factors of industrial environment;

- Active usage of recreational trainings in the period of health resort treatment;

- For early revelation of pre-nosological changes it is recommended for medical service to adopt the additional methods of express-diagnostics in execution of periodical medical examinations;

- Control of correctness and complexness of nutrition of workers under harmful conditions (elimination of zinc defecit, vitamin D deficit, i.e. provision of caloric nutrition of high quality);

- Prophylaxis work of shop doctors in area of alcohol abuse, diet breach, smoking, i.e. healthy lifestyle promotion;

- Work in improvement of labor conditions.

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