

*Materials of Conferences***IMMUNOPATHOLOGY  
OF THE PROFESSIONAL  
NEUROINTOXICATIONS**

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A significant number of chemical enterprises is situated within the territory of the Eastern Siberia, thousands of people that work there are the prior risk group since they are exposed to unfavourable production, social-ecological, economic, and other factors. So the total impact on their organisms is considerably higher. Numerous clinic-immunology inspections of people that work in contact with different neurotoxins (organic mercury, epihlorohydrin, vinyl chloride) allowed us to reveal a significant variation of the negative effects: from initial donosological alterations to clinically-expressed professional diseases.

In that case the exposure of the alterations peculiarities of the immunological indexes of workers that are induced by the exposure of production neurotoxins of different chemical nature turns to be quite urgent. A clinical immunological inspection of 133 male workers of the enterprise «Sayanchimplast» that are exposed to mercury impact, 185 men that are exposed to the impact of vinyl chloride, and 198 men that are involved into the production of epihlorohydrin «Usolechimprom». The comparison group consisted of 193 workers that do not interfere with unfavourable production factors.

Differently directed alterations of the immunological indexes of almost healthy people testify the different level of the adaptive mechanisms under different production risks exposure. The impact of the production factors inevitably induces the compensatory processes chain. The initial activation of the immunopathology cells can lead to various ends depending on a number of inner and outer factors (specificity, intensity, the duration of the unfavourable factor impact, genetical predisposition and other). Favourable conditions cause the condition of physiological adaptation. However, the durable impact of the unfavourable inner and outer factors upon workers provides for the development of secondary immune-deficient and autoimmune conditions. In that case the problem of the workers' organism resistance level definition becomes quite important, especially at that stage,

when the revealed alterations haven't lead to the professional pathologies development and are reversible.

It has been found that those that with the development of the immunopathology process of persons with a professional pathology (chronic mercury intoxication, toxic enciphalopaty) the decrease in the lymphocyte content that express CD3, CD4, CD8, CD16 on their surface and the growth of early(CD25) and later (CD95, HLA-DR) phases of lymphocyte activation markers in periphery blood. Workers that have more than 10 years of service under the impact of neurotoxins and do not have any pathological alterations also experience the increase (though less expressed in comparison with those who have professional pathologies) in lymphocytes that carry CD95 and HLA-DR. It is possible that the increase in density on their lymphocytes makes condition on the anomalous high perceptibility of immune system of workers to the antigens of their own tissue and the production environment. The results of our research showed that the autoimmune processes are involved into the development of the professional damages of nervous system. A weak increase in auto-antibodies to brain-specific proteins (BSP) of those that work under the conditions of mercury impact and chloride carbohydrates without any professional pathologies is conditioned by poli-clonal activation of cellular immune system elements and can be considered as a physiological protective mechanism. And only the high level and the high frequency of the self-sensitization testify their pathogenetical role. For example, as we said earlier about the fire liquidators with toxic encephalopathy in far, post-contact period (high levels of anti-bodies to BSP were found with 93,7%, to DNA – with 81,03% of the examined workers). In a number of cases with the staging of process the collection of a definite level of antibodies can be replaced by their complete sorption in tissue. We propose to testify our theory of an important role of autoimmune mechanism in the separate professional damages of nervous system and define the most significant humoral and cellular factors in the development of local and system autoimmune response, and to base their diagnosis and practical value in a number of present experimental and clinic researches. Thus, considering that the condition of the immune system is one of the defining factors of the professional neurointoxication development, the search for new methods of the selective immune-rehabilitation of the worker's immune disturbances becomes very

important. The knowledge of the immune system alteration dynamic legislations increases the effectiveness of the workers' health condition evaluation and prognosis.

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**THE TEENAGERS' CYTOGENETIC HOMEOSTASIS PECULIARITIES AND SPECIAL FEATURES UNDER THE ECOLOGICAL ENVIRONMENT PRESENT – DAY CONDITIONS**

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It is quite known, that the genetic homeostasis disorders symptoms, such as the micronuclei and the other nuclear anomalies, having revealed by the micro-nuclear test, are the

non-specific human organism reaction upon the various and the diverse (e.g. toxic, ecological and stress) influences. The cytogenetic homeostasis evaluation has been carried out at the 118 lyceum pupils at the age of the 13–15 years, having learned at the «Classical» №1 lyceum MOU in the Rostov-on-Don town.

The buccal epithelium cells research by means of the micro-nuclear test (e.g. Zhuleva and et. al., 1996) has been discovered some quantity nuclei with the nuclear disorders presence at all the examined and the tested ones: by the micro-nuclei, by the invaginations, by the «tails», by the double nuclei, by the constrictions. Thus, the lyceum pupils' cytogenetic homeostasis research results have already been presented in the Table 1.

The nuclear disorders relative quantity has been varied from 1 % up to 27 %, having made up in average  $6,907 \pm 0,404$ . The invaginations and the constrictions quantity from them has been varied in the ranges from 0 up to 8 %, having made up in average  $1,746 \pm 0,152$  and  $0,983 \pm 0,123$  correspondingly, the double nuclei quantity – from 0 up to 6 % (e.g.  $1,364 \pm 0,127$ ), the micro-nuclei – from 0 up to 9 % (e.g.  $0,881 \pm 0,133$ ) and the «tailing» nuclei – from 0 up to 13 % (e.g.  $1,932 \pm 0,180$ ).

**Table 1**

The Nuclear Disorders Relative Quantity in the Lyceum Pupils' Buccal Epithelium Cells (%)

	<i>N</i>	<i>M</i> ± <i>m</i>	Minimum	Maximum
The nuclear disorders	118	$6,907 \pm 0,404$	1	27
The constrictions	118	$0,983 \pm 0,123$	0	8
The invaginations	118	$1,746 \pm 0,152$	0	8
The double nuclei	118	$1,364 \pm 0,127$	0	6
The micro-nuclei	118	$0,881 \pm 0,133$	0	9
The «tailing» nuclei	118	$1,932 \pm 0,180$	0	13

The «tailing» nuclei (e.g. 28 %) have been prevailed at the examined and the tested lyceum pupils', the invaginations (e.g. 25 %), the double nuclei have been made up 20 %, the constrictions – 14 %, the micro-nuclei – 13 %.

Thus, it is quite evidently, that the nuclear disorders maximum quantity have been made up the invaginations and the «tailing» nuclei.

So, the correlation analysis has been carried out by us for the purpose of the possible connections revealing among the lyceum pupils' psycho-physiological characteristics and the

cytogenetic homeostasis level by means of the Spearman correlation rank coefficient. The final and the obtained results have been presented in the Tables 2 and 3.

As it can be seen from the Tables, the correlation analysis has already been revealed the reliable moderate positive connection presence between the school anxiety level and the buccal epithelial cells relative number with the micro-nuclei. So, the connections between the FMA profile characteristics and the cytogenetic homeostasis indices have not already been discovered.