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Immunologic disorders of the acute dioxin exposed patient

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1. Introduction

The feature of toxicodynamics of dioxins consists in a disorder of immunologic reactivity related to the intervention of ecotoxins into the process of maturing, differentiation and proliferation of immunocompetent cells. It is known that the immunotoxicity of dioxins is determined in a great extent by their intensity of metabolic activation on cytochrome P 4501 A affected by substantial genetic variations^{1,2)}.

Just because of this the nature and the extent of disorder of immune status, depending on the peculiarities of toxicokinetics, especially in the limited selection of contingent discussed, are not always unambiguous and they are exposed to considerable variations³⁾.

The joint chemical-biological investigations are of special importance, where the parallel evaluation of body burden dioxin content and immunoreactivity state is performed.

2. Objects and methods of investigations

We have performed the selected examination of immune status of a patient N., 54 years old, exposed to superacute dioxin intoxication in 1955-1967, accompanied with a skin manifestation (chloracne).

Mononuclears from the heparinized peripheral blood were separated on the gradient of ficoll-visotrat (Flow Lab.), washed with 0,15 M phosphate-buffers salt-solution (pH 7,2), containing 3 mM sodium azid and 0,2 % BSA, and weighed in the same medium. Phenotyping was performed with the help of the indirect immunofluorescent method using the monoclonal antibodies of clones LT (Sor bent) and JCO (Diagnostex). The lymphocytes reactivity to the mitogens - PHA (Flow Lab.), ConA (Flow Lab.) and PWM (Flow Lab.) has been evaluated by the traditional method. The immunoglobulins level in serum was determined according to the Mancini method.

The PCDD/Fs content in the whole blood (40 ml) was determined according to⁷⁾. The sample was spiked with 15 ¹³C₁₂ - 2,3,7,8-PCDD/Fs. The sample extract clean up was performed by use of standards method on the multilayer silica, carbon and alumina columns.

The ¹³C₁₂-1,2,3,4-TCDD and ¹³C₁₂-1,2,3,7,8,9-HxCDD were added as the internal standards to the final extract in 5 µl of dodecane. All the criteria of US EPA Method 1613 were fulfilled.

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mitogens were following (the stimulation index): for PHA-4; ConA - 1,8; PWM - 4. The level of immunoglobulins in serum was (g/l): IgG - 14; IgM - 2,5; IgM- 1,2.

Thus the patient N. has manifested the disbalance of immunoreactivity, expressed in terms of an increased amount of B- and NK-cells and lymphocytes, bearing the markers of early and late activation in peripheral blood and this is accompanied by the reduced response for the most part to the T-mitogens at relatively high response to mitogen. The alterations described are rather typical for Vietnam war veterans ⁷.

4. References

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