

## Studies of the PCDDs, PCDFs and PCBs levels in the human milk in the Ukraine. State of the problem and perspectives.

Soya R., Snoz L.

National Institute of Health, Heroiv oborony St., 6, 252127, Kyiv, Ukraine.

PCDDs and related compounds have received a high level of attention from a scientific, regulatory and even political point of view during the past years. Accordance of last years investigations, PCDDs, PCDFs and PCBs changing immunological reactions, depressing firstly and secondary antibody reactions and immunoglobulines level in the serum and decreasing organism resistance for virus and bacterial infection<sup>1,2</sup>. Results of the PCDDs, PCDFs and PCBs mutagenic effects are discrepant because majority scientists thinking these compounds are non-inducers but promoters of neoplasm growth<sup>3</sup>.

Toxicological particularity these xenobiotics related in first time with its high lipophylity, stability and its ability for accumulation in the living organisms, above all in the lipoid tissues, liver, skin, thymus and bloodforming organs<sup>4,5</sup>. The final distribution PCDDs, PCDFs and PCBs isomers in the tissues and organs depending with structure of these compounds and its relative metabolic rate. It was shown the PCDDs, PCDFs and PCBs bioaccumulation and biodegradation in the human milk and tissues depending at the isomers structure. Possibility liver is an organ-target for PCBs effects on the organism. This organ accumulated and transformed of these chemicals. The basic enzyme of this biotransformation is a cytochrome P-450 system - hydroxylation system for the majority xenobiotics. PCDDs, PCDFs and PCBs hepatotropic effects are more typical effects for its chemicals<sup>6</sup>.

More than 20 years PCDDs and related compounds well known as occurring everywhere environmental pollutant that accumulated in the human tissues. Because in the industrial countries PCDDs, PCDFs and PCBs level was measuring in the all analysed probes of the blood, lipoid tissues and human milk. Estimation of the majority results of the PCDDs, PCDFs and PCBs levels studies impeded using of the different analytical methods. Accordance these results, backgrounds of the PCDDs, PCDFs and PCBs levels in the citizens of the industrial countries are identically and stability. In latest years USA and EEC countries PCDDs, PCDFs and PCBs production and using high decreased or completely suppress but its levels in the human tissues are not decreased<sup>3</sup>.

Ukraine, which occupies a vast territory in the center of Europe, is ecologically most unfavorable among all countries of the continent. It is a cause of anthropogenic environmental contamination by various chemical compounds due to intensive agricultural and industrial works. Ukraine have a developed electrotechnical industry, a wide variety production and application of chlorinated pesticides and other potential sources of PCBs and its oxidative transformation products (PCDDs, PCDFS, etc.). A great affairs need to develop to provide tools to control risk in this important area. Thus study of the exposure of the PCDDs, PCDFs and PCBs levels in human milk is a very actuated for the Ukraine.

We studied the PCDDs and related compounds levels in the human milk in the two regions of the Kiev. Analysis were conducted in the laboratory of RIVM (Netherlands) under financial support of EURO-WHO. Two averaged samples of human milk were collected in different regions of Kiev. The first was collected in the centre region, where not industrial enterprises are situated, the second - in region with a number of plants, producing the chlorinated chemicals. In every of average sample with both total volume of 250 ml were contained the milk from 5 women. Age of mothers was 19-29, theirs dietary habits was 80% mixed diet in both groups.

The samples were analysed for congener profile of dioxins, furans, non-ortho PCBs, normal PCBs and other dioxin-related PCBs. The results of dioxin is shown in comparing with typical level profile. The averaged date from Nordic countries and FRG were selected as typical level profile.

In can be noticed, that the total TEQ of both mentioned samples were average, relatively European countries. At same time it must be pointed out, that relatively high level of 2,3,7,8-TCDD was detected in the polluted region 2, exceeding on 55% the typical level profile and on approximately 80% the level in control region 1.

Concerning the PCBs, they make significant contribution to the total TEQ: non-ortho PCBs have 9.3 points in the region 1, and 6.0 - in region 2. Other PCBs have respectively 15.2 and 15.6 points, which exceeded the numbers for dioxins.

There are a lot of sites in the Ukraine, especially in Eastern-Ukrainian industrial region (Donbas), where number of plants producing chlorinated chemicals are situated. There is no doubts, that these regions can provide, significantly differ from those, obtained in this study. Unfortunately, future investigations of these chemicals levels in other areas of the Ukraine it was not worked. But it very need for PCDDs risk assessment and development human health and environmental protection.

Now we planning, accordance of the WHO recommendations<sup>7)</sup>, to investigate the PCDDs, PCDFs and PCBs levels in the human milk in the different areas of the Ukraine: Kiev - central district (non-industrial) and industrial district (record the 1993 years studies); Donbas region and Chmelnitsky region (industrial and agricultural areas) and South Krimea, as non-industrial and non-agricultural area.

Development of this studies way is very important for creation of environmental protection system in Ukraine. But risk assessment will be developing a important fundamental problems - effects of this chemicals on human organism. If there in an indication high exposure of a local population, specific pathways of contamination through air, soil, water and food should be investigated.

# HUM I

In areas with exceptionally high exposure, the relations between levels, sources of exposure and potential health effects should be evaluated. In results of exposure studies to expand the database, allow detection of possible trends in exposure PCDDs, PCDFs and PCBs and identify geographical areas of the Ukraine with high exposure. This database may be using Ukrainian scientists and WHO experts.

## References.

- 1) Sova R.Ye., Dmitrenko N.P., Medvedev V.I., Snoz S.V., Snoz L.L., Toxicity and immunotoxicity of the polychlorinated dibenzodioxins and dibenzofurans// Toxicological vestnik.-1994. N1- p.7-12.
- 2) Kiselev N.F., Filatov B.N., Sova R.Ye. Ecology-Hygienic Problems Posed by Dioxin and Related Compounds. // Hyg. and Sanitary. - 1991.- N. 7, pp.67-75.
- 3) Kimbrough R.D., Ed. Jensen A.A. Halogenated Biphenyls; Terphenyls, Naphthalenes, Dibenzodioxins and Related Compounds// Topics in environmental health, Vol.4. 2-nd Edition, 1989, Elsevier - Amsterdam - New York - Oxford.-518 p.
- 4) Gobor G., Yamashita K. Comparison of kinetics of chlorinated and brominated dioxins and furans// In Short Papers of Dioxin-93.- Vol.13.- P.203-206.
- 5) Zober A. Laboratory results for selected target organs in 138 individuals occupationally exposure TCDD// In Short Papers of Dioxin-93.- Vol.13.- P.123-126.
- 6) Tsyrlor I., Ostashevsky V., Gerasimov K., Rumak V. Characteristics of hepatic and lymphocyte monooxygenases in South Vietnam's people with chlorophenoxy herbicides exposure// In Short Papers of Dioxin-90.- Vol.1.- P.305-308.
- 7) Reports of the WHO Meeting "Second round of exposure studies on levels of PCBs, PCDDs and PCDFs in human milk" (Berlin, 23-24 March 1994).