HEALTH OF WOMEN EXPOSED TO 2,4,5-T, THEIR CHILDREN AND GRANDCHILDREN

Lena Karamova, Gousel Basharova, Frima Pyanova

Ufa Research Institute of Occupational Health and Human Ecology
94 Kouvykin str., Ufa, 450106, RUSSIA

Introduction

In 1993 in materials of the international symposium Dioxin'93 A. Schecter and I.I.Ryan (1) for the first time published data about dioxin content in blood serum of women formerly working in the production of 2,4,5-T at the Ufa industrial association "Khimprom" and their children (table 1).

Data tastify that in 30 years of the postcontact period the level of dioxin content in their blood serum is much higher than that in background ones. This level is also appreciably higher in their children born by theim actually during their contact with 2,4,5-T or in the nearest postcontact period. We have taken an interest in changes in the health state of these working women during all the years since the moment of clinical manifestation of chloracne.

Methods

We have found all medical documentation on them in archives of medical establishments. All of them have still been working at the "Khimprom" association. So, they have been invited to a complex and all-round examination in the Institute clinic.

Results and discussion

Investigation showed that at the age of 20-21 they had had chloracne with moderate skin manifestation. After 6-8 month intensive treatment their skin lesion disappeared. The changes on the part of other organs and systems were expressed by vegetovascular dystonia of hypertension type, which was characterized by the rise of arterial blood pressure within the limits of the "boundary" zone (140-149 mm for systolic pressure and 80-89 mm for diastolic one according to WHO recommendations), headache, fatiguability, erethism, weakness, expressed dermographism, excessive sweating, heart pain, thermoassymmetry, resuscitation of tendon reflexes etc. The tendency to increase cholesterin indices and cytopenia reaction was detected on the part of peripheral blood.

In succeeding years vegetovascular disturbances gradually became more expressed, cardiovascular pathology was formed, symptoms of disturbances in lipoid metabolism, blood coagulability and immunity were growing.

In the remote period (28-30 years later) the health state of all the four working women was characterized by the expressed vegetovascular disturbance with deencephalitic crisis, formation of hypertonic disease, pathology of digestive organs, disorder in the formation of cholesterin, immunity suppression and a tendency toward autoimmunization. Some clinical indices of people in whose blood the dioxin levels were detected are given in Table 2.

Retrospective analysis of reproductive function showed that for the four women there were 11 pregnancies, 6 of them risulted in delivery, 4 - in abortion, 1 - in spontaneous abortion. The delivery passed without complications with maturity of the fetus. Reproductive function of the women and health indices of their children and grandchildren are given in Table 3.

Conclusion

Time health trend of the women who had had clinical manifestation of dioxin exposure at their young age, and in whose blood elevated levels of the supertoxicant were detected 25-28 years later has allowed to trace the dynamics of their health state formation, its nosologic forms, changes on the part of the blood and immunity, of their reproductive function and the health state of their children and grandchildren. Desadaptation of cardiovascular system and digestive organs was revealed in them rather early. Allergic state of their children and grandchildren also came to our interest.

Reference

1. Schecter A., Ryan I.I. *Exposure of Female Production Workers and their Children in Ufa, Russia to PCDDs (PSDFs), PCBs.* Dioxin **1993**, vol. 13, -P. 55-59.

Content of dioxins dibensofurans, co-planar PCB in the blood of women working at "Khimprom", their children and Grandchildren (no Sehecter A. and Ryan I.I.)

Patients	1		2		3			4			mothers n = 4		Children N = 6		popul ation contro l 100
	Mother	Daughter	Mother	son	Mother	Daughter	son	Mother	son	Son	mean value	min-max	Mean Value	min-max	
Membes of family age Indices, ng/ml	50	28	50	27	50	21	19	48	23	18					
Toxicity equivalent: TCDD	144	31	61	41	194	80	63	273	41	38	391	143 - 791	397	143 - 198	112
PCDF	154	38	68	47	222	97	93	292	52	46	43	25-56	61	38-51	26
PCDD	13	13	12	15	14	19	21	14	8	7	434	168 - 847	458	185 - 249	138
PCB	9	7	5	7	9	8	15	6	3	3	180	135 - 158	327	146 - 205	147
Overall toxicity equivalent	176	58	85	69	245	124	129	321	63	56					

Table 2

Some clinical indices of women in whose blood dioxin levels were detected

Patients, age Occupation	Patient N 1, 50 lab, assistant	Patient N 2, 50 lab. assistant	Patient N 3, 50 lab. assistant	Patient N 4, 48 lab. assistant
2,3,7,8-TCDD content in ng/g of blood lipid Indices	1991-291 1992-144 Σ-176	1991-134 1992-61 Σ-85	1991-287 1992-197 Σ-245	1991-272 Σ-321
Chloracne in anamnesis	yes	no	yes	Yes
Cardiovascular system diseases	hypertension	-	-	Hypertension
Central nervous system diseases	Vegetovascular distonia (VVD) Neurocirculatory dystonia (NCD)	NCD	NCD	NCD encephalopathia
Digestive organ diseases	Gastritis, cholecystitis, hepatopathia, pancreopathia	cholecystitis	Gastritis, cholecystitis	Gastritis, cholecystitis
Metabolism diseases	-	thiroid gland operation, in 1983	-	-
Buildup of arterial blood pressure	+	+	+	+
Skin	clean	clean	clean	Clean
Leucocytes-eosinophils, x 10^9/l, %	4,1-2,0	5,7-4	4,4-0	4,4-0
Lymphocytes-monocytes, %	4,00-4	42-8	28,0-7,0	36,0-4
Reticulocytes-thrombocytes, ‰	10,0-413,6	8,8-238,5	9,8-245,0	8,8-222,5
Amylase,alkaline phosphotase, Un/l	16,0-73,0	26,7-68,0	18,0-71,3	6,0-65,0
ALT, Asp-AT, GGT, Un/l	14-25-38,5	0,66-0,57-6,0	15-24-37,5	13,0-15-9
Colloid stability of serum	80,0	80,0	82,0	80,0
Bilirubin, mM/l	15,13	14,6	13,3	9,23-11,8
Corpoporphirin mkg/g/creatine	34,7	126,9	32,6	37,6
Aminolevulinic acid mg/g	1,8	1,8	1,6	1,6
Cholesterin, mg %	3,79	6,19	3,37	6,6
Beta lipoprotein, g/l	4,2	3,7	3,8	5,23
Peroxide oxidation of lipids, mM/l	3,0	3,7	3,3	3,0
Mean molecules, λ_{254}, λ_{282}	0,291-0,92	0,245-0,335	0,290-0,294	0,245-0,262
Haptoglobin, Un/l	1,1	1,1	1,1	1,3
Glucose, mM/l	4,2	4,6	4,0	5,3
Fibrinogen	3,7	3,8	3,5	4,0
Lymphocytes T,B,T_0,%	59,0-18,0-21,0	58-19-21,4	57,0-19-20,0	57-29-38
Th, Tc/s, %	38,0-26,0	33,0-26,5	38,0-26,5	29,0-28,0
Leucocytes phagocytic activity, circulating immuno-globulins, % conv. Un	30,0-147,0	60,0-104,0	58,0-102,0	70,0-80,0
Neutralization of NBT spontaneous, NNBT stimulated	0,65-0,67	0,64-0,69	0,65-0,68	0,64-0,72
Immunoglobulins M,A,G, g/l	1,5-2,9-16,8	1,4-1,3-20,0	1,4-3,2-18,0	1,16-4,5-22,3

Table 3

Reproductive function of women formerly having chloracne, health state of their children and grandchildren

Women; Toxicity equivalent	N 1, Σ=176	N 2, Σ=85,0	N 3, Σ=245,00		N 4, Σ - 321,0	
Chloracne	in 1966	No	in 1966		in 1966	
Reproduction	delivery- 1 med. abortion- 1 spont. abortion- 1	Delivery- 1 med. Abortion- 1	delivery -2 med. abortion- 1		Delivery- 2 med. Abortion- 1	
Children:	daughter born in 1965	Son born in 1965	daughter born in 1971	son born in 1973	Son born in 1969	son born in 1974
Overall toxicity equivalent	58,0	69,0	124,0	129,0	63	56
Chloracne	no	No	no	no	no	no
Pathology	allergy	Healthy	healthy	healthy	cronic bronchitis	healthy
Grandchildren:	grandson born in 1991	Grandson born in 1990	grandson born in 1991	-	granddaught er born in 1991	-
Pathology	food allergy	Healthy	healthy	-	healthy	-