CHILDREN MORBIDITY IN THE REGION OF UFA, RUSSIA

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1. INTRODUCTION

Ufa, the capital of the Republic of Bashkortostan, Russia, is known to be one of the largest centres of oil-chemical industry in the CIS. Production of herbicides, some organic and nonorganic acids, chlorine organic compounds and other chemicals is concentrated there. At the CHIMPROM MANUFACTURING COMPLEX workers are involved with 2,4,5-T production. So they are likely exposed to highly toxic substances such as congener-specific dioxin (2,3,7,8-TCDD), dibenzofuran (PCDF), coplanar polychlorinated biphenyl (PCB). Besides, these compounds appear in relatively high concentrations in the atmosphere and polluted the air of near-by dwelling regions. Workers involved with 2,4,5-T production at the CHIMPROM MANUFACTURING COMPLEX were reported to have elevated levels of 2,3,5,7,8-TCDD in their blood[1]. In the next study, blood from a control group (the general Ufa population) was analyzed. 2,3,7,8-TCDD level in the control group was much higher than that registered elsewhere in Russia[2]. The most probable route of exposure for the children from dioxin-exposed workers was considered to be through nursering, although this cannot presently be verified[3]. It was supposed to be the first documentation of TCDD exposed mothers transmitting TCDD to nursing infants leading to elevated TCDD levels in children.

2. OBJECTIVE

To reveal changes in total morbidity and prevalence rates of different diseases among general Ufa children population during the last 14 years (1981-1993).

3. METHODS

The morbidity among the general Ufa children population was studied on the data presented by the Central Statistic Department of Bashkortostan and the Republic Children Hospital. The received data were mathematically processed. The standard error was calculated using the simple estimate of the intragroup correlation coefficient. Chi-squared analyses of contingency tables and test, chi-squared test for trend were used to assess the differences in the prevalence rates.

4. RESULTS AND DISCUSSION

The data presented in our investigation demonstrate the increasing tendency in the total morbidity among the general Ufa children population (from 169,1 to 1996,96 per 1000). At the same time three peaks of morbidity were observed relating mainly to the years of 1988, 1991 and 1993. Most evident changes took place in the prevalence rates of different diseases (Table 1). Thus during the period in question, cases of tumor were up by 285 times, of atopic dermatitis - by 13 times, cases of bronchial asthma - by 4,5 times, the prevalence of digestive system diseases - twice, mainly in its upper parts, gastritis, duodenitis in particular - over 11 times, blood and hemopoietic organs diseases - thrice, and anemia (by 7 times). Moreover peaks of morbidity for some diseases were determined. Thus the maximum rate of tumors and allergic diseases was registered in 1988, 1991-1992; of intestinal diseases - in 1991-1993; blood and hemopoietic organs diseases - in 1992; anemia - since 1988. It should be noted that the obtained data are about 2-2,5 times the data reported in literature. The dynamics of prevalence rate of the diseases with immune pathologic mechanism of development is of certain interest. Sufficiently intensive increase in the number of cases of blood circulation diseases has been observed since 1991, a peak of chronic rheumatic diseases - in 1993 (mainly on the account of severe systematic pathology). At the same time the prevalence rate of rheumatoid arthritis went up by 4,5 times. Distinct increase (by 5 times) of chronic lung pathologies has been observed in the last 5 years, the most considerable growth was registered in 1991-1992. The prevalence rate of the nervous system diseases among children is characterised by nearly 1,5 multiple excess for the period of 1989 and 1991. The data presented testify to the twice multiple excess for the osteomuscular diseases, also including various minor pathologies in the development. Thus, the peak of prevalence rate of the majority of diseases investigated in children was in 1991-1992. In this connection the coincidence of the latter with the accident at the Chimprom Manufacturing Complex in February and March, 1991, accompanied by considerable excess of phenol, dioxins and dioxinlike compounds in drinking water used by Ufa dwellers presents certain interest. The above-mentioned observations suggest a causal relationship between children morbidity and dioxin exposure.

5. REFERENCES

1) Schecter AJ, Ryan JJ, Papke O, Ball M, Lis A. Elevated dioxin levels in the blood of male and female Russian workers with and without chloracne 25 years after phenoxyherbicide exposure: the Ufa "Khimprom" incident. Chemosphere 1993.
2) Schecter AJ, Papke O, Ball M, Grachev M, Beim A, Koptug V, Hoang Dinh Cau, Le Cao Dai, Hoang Tri Quynh, Nguyen Ngoc Thi Phoung, Huynk Kim Chi. Dioxin and dibenzofuran levels in humar blood samples from Guam, Russia, Germany, Vietnam and the USA. Chemosphere 1992; 25:1129-1134.
3) Schecter A, Ryan JJ. Exposure of female production workers and their children in Ufa, Russia to PCDDS/PCDFS/PLANAR PCDs. Dioxin '93; V.13:55-56.

Table 1. THE PREVALENCE RATES OF DIFFERENT DISEASES IN THE GENERAL UFA CHILDREN POPULATION (per 1000 of children population)

DISEASES	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Oncological			0.01		0.08	0.13	0.09	1.5	2.1	1.9	3.04	3.01	2.85
Atopic	1.1	1.2	1.3	1.7	3.3	3.76	4.4	6.6	6.8	6.3	8.8	9.9	13.6
Asthma	1.5	1.9	1.9	1.9	2.28	2.4	2.9	4.4	4.5	3.2	2.7	2.8	5.2
Digestive system									193.0	114.5	148.0	146.0	345.4
Gastritis, duodenitis								6.7	6.4	5.2	16.7	30.0	68.4
Blood and hemopoietic organs								19.3	23.1	20.6	19.9	28.4	43.2
Anaemia	5.0	5.0	8.0	10.0		9.4	6.0	17.9	22.5	19.3	19.9	28.4	43.2
Blood circulation								17.1	17.7	10.0	20.7	21.5	32.5
Chronic rheumatic	6.3	5.4	4.2	3.9		2.9	2.4	1.9	1.5	0.12	1.18	0.96	11.1
Rheumatoid arthritis	0.2	0.4	0.4	0.5	0.6	0.75	0.9	1.2	1.2	1.0	0.9	0.9	
Chronic pulmonary									0.3	0.2	1.8	3.0	1.5
Pneumonia		10.4	11.3	11.2	7.8	8.1	8.5	7.9	5.2	2.2	3.0	1.9	3.2
Osteomuscular								26.1	29.6	26.5	34.7	37.8	58.3
Nervous system								87.4	140.8	117.3	138.2	98.5	96.1