

Dioxin '97, Indianapolis, Indiana, USA

Neuropathology of Workers Exposed to Dioxin

Basharova G., Podrez Z., Karamova L., Pyanova F.

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

1. Introduction

Nowadays the problem of dioxins is one of the currently central studies in medicine. The number of diseases caused by dioxins is increasing. It has awakened fresh interest in this kind of pathology and lent impetus to its successful research.

According to WHO data, peculiar features of dioxin exposure are skin affections - chloracne, appearing in 80-90% of cases. Dioxins also cause suppression of the organism immune system and adaptation processes. Pathologic process involves practically all the organs and systems, with skin affections being predominant.

In 1965-1967 at Chimprom Production Association there was a shop producing one of the most promising at that time herbicide - butyl ether of 2,4,5-trichlorophenoxyacetic acid (2,4,5-T). The majority of that shop workers (83,5%) had skin affections - chloracne.

2. Research Methods

This paper presents materials concerning the nervous system state of people occupationally contacting with herbicide - butyl ether 2,4,5-T. Primary materials of clinical examinations of all the affected workers are taken from the Ufa Research Institute of Occupational Health and Human Ecology Archives. Case histories of 3 year period are retrospectively analysed in the light of dioxin exposure. Those workers health state is investigated in dynamics of the following years and at present (1991-1994) by means of clinicofunctional and laboratory methods complex.

Data describing nervous system state of people affected by chloracne in contact and postcontact period during 30 years are given in this paper.

3. Results

It was found retrospectively and in anamnesis that occupational chloracne revealed in 71,6-96% of workers examined in dynamics led to closing down the shop in 1967.

EPIDEMIOLOGY

On clinical examination of the affected people the following complaints of nervous system state emerged: headache (63,8%), sleepiness (46,9%), insomnia (12,7%), increased irritability (36,1%), fatigue (29,2%), weakness (28,9%), pain near the heart (20,5%), reduced memory (21%), reduced potency (6%). On objective examination many patients showed depressed mood, leanness, increase of tendon jerks, eyelid tremor, vegetative disorder in the form of steady red dermographism, general hyperhidrosis, arterial tension fluctuations, pulse lability.

Nervous system changes were expressed in forming neurosthenic syndrome, asteno-vegetative syndrome.

In 1984 a research-practical work on health state assessment of workers who had had contact with 2,4,5-T and occupational chloracne in the past was carried out under the supervision of L.Belomytseva.

Of the 128 people examined in 1966-1968 by L. Bikbulatova and K.Teleguina the information on health state of 83 workers was gathered, and 39 workers went into clinic for a check-up. By the time of the second complex check-up the workers' age was about 38-42.

Examination showed that 18 years later the character of neurologic complaints practically did not change, but they became inherent to more patients. The most frequent vegetative disturbances were asthenic states with neurotic reactions. Circulatory changes of predominantly hypertonic character were revealed in almost half of the patients. Diseases of peripheral nervous system (radiculitis, lumbago) were revealed in 70%. It is important to notice that vegeto-vascular disregulation revealed during the first examination (in 1966-1968) transferred into hypertension in 15,4% and ischemia in 13,0%.

In 1991-1994 the third complex check-up of the cohort group with the specially worked out program was held. 73 people aged $52 \pm 1,4$ who had had chloracne in 1965-1967 were examined. The majority of them complained of dull pressing headache mainly locating in the occipital and frontotemporal parts, sometimes in the parietal part. Headache was often of the attack character accompanied by dizziness and nausea. The patients complained of restless intermittent sleep, sometimes insomnia. Most of them pointed out increased irritability and susceptibility, rapid change of mood, increased fatigue, pain near the heart, memory reduction, pain in limbs, sensation of numbness in hands especially at night, gnawing pain in joints and in backbone.

Objective examination often showed soft organic signs in the form of inadequate convergence, slight asymmetry of the nasolabial folds, slight coordination disturbance, algesia decrease in the distal parts of the limbs, increase or decrease of tendon reflexes. There were considerable changes in the vegetative nervous system, steady red

Dioxin '97, Indianapolis, Indiana, USA

dermographism, general hyperhidrosis, sometimes acrocyanosis, pulse lability with the tendency to tachycardia, arterial tension fluctuations, in most cases hypertension. Many patients showed decreased capacity for work, rapid exhaustion, distinct meteorodependence.

Tendency towards depressions was observed on the background of general asthenisation. Arthralgia, muscular and radicular pains were also specified. The foregoing symptomatics was indicative of the chronic insufficiency of cerebral circulation, which was supported by the functional investigation methods.

Electroencephalograms showed as a rule steady diffusion changes in bioelectrical activity of the brain with the definite picture of the middle structures. Rheoencephalograms were characterized by low intensity of the pulse bloodfilling, increased and unsteady tone of the cerebral hemispheres vessels, difficulty of venous flow. Functional tests demonstrated decrease of compensation and adaptation mechanisms, decrease of vessel wall elasticity. Nervous system state analysis of the most workers revealed vegetative-vascular disfunction, neurocirculatory asthenia of hypertension type, encephalopathy with hypothalamus crisis. The most patients showed vertebral osteochondrosis, chronic lumbosacral radiculitis.

In patients with the formed picture of encephalopathy in postcontact period the neurological and psychopathological symptoms were of stable character; symptoms of asthenia and neurosis did not disappear, but gained more organic character because of the added vascular and age disregulations. In the longterm follow-up the vegetative-vascular disfunction transformed into arterial hypertension, while vegetative-vascular paroxysms transferred into hypertension crisis.

3. Conclusion

Thus, dynamics of neurological status in people exposed to 2,4,5-T showed that chloracne took place on the background of vegetative-vascular disfunctions of predominantly symptomatic-adrenal character. During the distant post-contact period the somatization of vegetative nervous system changes took place along with the transformation of vegetative disfunctions into vascular diseases of the brain, i.e. cerebral atherosclerosis with the syndrome of discirculatory encephalopathy.