

Dynamics of Skin Affections in Dioxin Exposure

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1. Introduction

Investigations of dioxin exposure under the production conditions have revealed that practically all the human organs and systems are involved in the pathological process but to a variable degree. Symptoms related to skin lesion, liver affection, digestion disorder, nervous diseases, immunity decrease usually prevail. However almost all the researchers consider skin lesion to be the main clinical sign of the dioxins exposure. According to WHO data the main character of dioxin intoxication in people is chloracne, which is revealed is 80-90% of cases. 100mkg/kg TCDD dose of skin application is considered to be enough to cause chloracne, while the minimal rated toxic dose of TCDD for people with chronic introduction is 0,1 mkg/kg (12).

2. Materials and Methods

In 1965-1967 Ufa Chimprom Production Association produced the 2,4,5-T herbicide. The majority of workers having occupational contact with that product suffered from the skin affection diagnosed by specialists-dermatologists as professional acne - chloracne. 128 people affected at the same time formed the cohort group.

Common integuments state of people comprising the cohort group was studied retrospectively and prospectively for the period of 1965-1995. The first investigation stage related to 1965-1968 was fulfilled by K.Teleguina and L.Bikbulatova (1); the stage of 1984 was carried out under the supervision of L. Belomytseva (2); the third stage was completed in 1991-95 by the authors. Complex clinicodiagnostic and laboratory examinations were carried out at all the stages. Common integuments and their functions were investigated by specialists in all the cases.

3. Results

In the former USSR the question of 2,3,7,8-TCDD content in the herbicide 2,4,5-T was not posed and adequate measurements were not made. Calculations made by L.Fyodorov in 1993 (13) showed that this toxicant content in the herbicide 2,4,5-T had been not less than 30-40 mg/kg and could have reached 70-100 mg/kg in the 1960-s. 20-24 year old workers were employed in the shop producing that herbicide. On

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examination of 150 workers 128 of them were diagnosed as affected by chloracne. The production of 2,4,5-T was closed and the affected people underwent intensive treatment.

Common integuments state at the period of production contact characterised the acute affection clinic. The first affection signs appeared in 2-3 months of work in the shop. They showed up as dryness of the skin, scaling, itch predominantly on face, near the eye corners, on temples, in zygoma and ear area - symmetrically on both sides. The development of the affection was slow, lingering and distinctly marked from the point of view of clinics.

Eruptions in the form of acne, milium and comedones appeared only after 6-8 month contact with 2,4,5-T. The affection clinics that caused people to seek medical help developed mostly by the 10-12 month contact with the product. Acne related to sebaceous glands and follicular system gradually began to take on polymorphic character (comedones, milia, papules) and spread to the floor of the auricle, lobule of the ear, lateral and back surfaces of the neck. In the clinical course of skin affections there were three distinct degrees of gravity. The process development was manifested by the increase of polymorphic formations on the skin, the appearance of milia and black comedones which often merged into atheromas being sometimes complicated by pyoderma and folliculitis. Caseous mass was emitted by acne formations on being pressed. Little scars appeared instead of the former acne. In the subsequent course of the affection the eruptions spreaded to the skin of shoulder girdle, breast, back, thighs, buttocks, external genitals. The skin acquired sallow greyish complexion, slight edema and thickening. Luminescent diagnostics revealed brown - aspid pigmentation of the affected area and hyperkeratosis symptoms. Patients' general condition got aggravated in the medium or heavy common integuments affection. Active intensive treatment showed reversability of all the skin eruptions. On the average the majority of patients got rid of chloracne in 6 months. However, about one third of the patients had been getting treatments for about 12-18 months.

Examination of 39 people from that cohort group 18 years later did not reveal any acne at all. But skin dryness and itch were noted in 8,0%, some rash - in 7,7%. Some patients still had little scars after the former purulent acne. Particular emphasis was placed upon skin changes in the form of erythrasma (12,8%), simple uncomplicated acne (8,0%), seborrhea oleosa (7,7%), hyperkeratosis (3,2%), dermatitis (3,2%), furuncle (3,2%).

The last common integuments examination of 73 people from those 128 who had endured chloracne 30 years before showed that none of them had occupational acne, but only 15% had clean skin. The rest 85% had papular formations of different sizes on the back and shoulder skin. The formations were from punctate to 0,3 x 0,3 cm in size, some of them were brown. Among them there were warty formations, papillomae, vascular points. Taken together they produced rather a mixed picture on the skin, but the patients did not have any subjective sensations. Single cases of dermatitis and eczema were also revealed.

4. Conclusion

Thus, the examination of common integuments state in workers exposed to dioxins in dynamics during the contact with 2,4,5-T, 18 years after the contact and in 30 year postcontact period allowed to follow and reveal different period skin affections of the clinical results of this product contact and to draw the following conclusions:

1. Chloracne is the most pronounced skin manifestation of the organism reaction. It is revealed in the absolute majority of people exposed to dioxin.
2. Occupational skin affection chloracne is completely curable provided that the contact with 2,4,5-T is ceased and active treatment is carried out.
3. Polymorphic skin formations in the form of plural pigmental and hyperkeratic and proliferative formations, papula and vascular points having no subjective sensations can be considered as distant consequences of the endured chloracne.

5. References

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