

CLINICAL EFFECTS OF CHRONIC LOW DOSES IRRADIATION
(11 YEARS AFTER CHERNOBYL ACCIDENT)



XA9745628

Romanenko A. Y. , Bebeshko V.G.
Scientific Center for Radiation Medicine, Kiev, Ukraine

Abstract. Estimation of clinical effects of influence low doses of irradiation as the result of the Chernobyl accident on the human organism is presented in this report. The results of the investigations are concerning to changings in different organs and systems of inhabitants of the contamination territories and among clean-up workers. Increasing of morbidity of digestive and nervous systems is notified. Increase of thyroid cancer, chronic thyroidities and hypothyreouses is registred in clean-up workers in dynamic observation. Highly morbidity of bronchopulmonal system and blood circulation system is revealed. High level of compensative and adaptative reactions of immune and hemopoietic systems is notified. Excesses of leukemias and lymphomas in inhabitants of the contamination territories is not demonstrated but tendency for increasing quantity cases of oncohematological diseases (leukemias, lymphomas, MDS) among clean-up workers IV-VII 1986 are absent. A dynamic of health state of children injured as a result of Chernobyl accident is characterized with continues negative tendencies.

The total disregulation syndrome (i.e. primary forming of functional declinations on the level of many physiological systems of organism and development of pre-nozological states with transfer to clinical nozology later) is developed due to distabilisation of functional systems activity of an organism at the different levels its integration in personal deficiency of reparative and compensative process in some personals who have been exposed with ionizing radiation in small doses and others accompanied factors of Chernobyl accident (chemical substances and stress).

The primary and initiative disturbances of regulative systems (central nervous, vegetative and hormonal-humoral systems) lie in a fundamental of increasing volume of functional clinations in different organs and tissues of many persons at least measure in region of doses from 0.25 to 1 Gy.

The generalize analysis of the data received from more than 120000 persons irradiated in low doses area is notified the highly morbidity of the all organs and systems in comparison with persons with acute radiation syndrome of 1 and 2 degree. Possibly this fact is connected with forming higher level of trouble among this group patients that undoubtedly has influenced on development chronic disstress and in connecting with it enhancing erosive and ulcerous processes in digestive system last 2-3 years.

Analogical type of frequency arrangements is notified under development of declinations of respiratory system.

First of all it is necessary to study the forming and evolution of changes in the different organs and systems among injureds in dynamic for period after Chernobyl accident.

Characterizing epidemiological situation concerning to development diseases of a blood circulation system should be attracted attention to high expansion of risk factors of this diseases. The risk factors are found out for 78.4% clean-up workers including that for 23.1% there was more than three. For considered ten factors it was prevailing the hereditary predilection, hypertension, cholesteremia, smoking, use alcohol and age.

The reason of 60% cases of deaths is the diseases of blood circulation system render strong influence on the health state of liquidators of consequences of accident and population.

In sphere of medical consequences of the accident the mental-nervous disorders are serios and significant problem.

Last years in spite of decreasing of a frequency of vegetovascular dystonies stability of vegetative disturbances and polymorphism their appearances have been following up definitely and also a tendency to development stability states in view discirculative encephalopathies, paroxysmal forms of vegeto-vascular dystonies and transfer mental-physiological disturbances into psychosomatics.

A development of psychosomatic diseases in persons, suffered as a result of Chernobyl accident, happens with obligated participation of disturbances nonspecific mechanisms of endocrine regulation of adopting system.

Thyroid occupies special place in estimation of medical consequences of Chernobyl accident. From 1993 it is observed growth expansion of thyroid cancer among adults who are related to categories enhancing thyroid risk. It consists of 6.8 cases per 10000 population among evacuated persons from 30-km zone and liquidators of consequences of accident in Chernobyl in April-May 1986. The growth of expansion chronic thyroidities and hypothyreoses is notified.

Dynamic observation for a state of immune system evidents of safety humoral link of immunity in general. In this case express individual and temporal violations in concentration of some classes of immunoglobulins it is noted. General types of changings are characterized by being of realized dysplatic, dysregulating syndromes or compensated radiation influence. A compensation of radiation influence is appear in normal expression of differential antigens and in volume of general subpopulations T- and B- lymphocytes. The pointed immunological behaviour is jointed with high expression of differential CD45 antigen on the lymphocytes and cells of granulocytic number.

As a rule, hematologic effects as the result of influence of low doses for the long temporal period are feebly expressed. Only some persons exposed of irradiation have ones. Hematologic effects appear in qualitative and quantitative changes of hemopoiesis elements although the quantitative indexes of blood are fluctuated in physiological bounds.

High compensative and adaptative possibilities of hemopoietic system are able to demonstrate on decay time of qualitative changings in neutrophiles, lymphocytes, thrombocytes as both in liquidators of consequences of accident in region of doses from 0.25 to 1 Gy as in population living on contamination territories. However, function of cell-predecessors of a hemopoiesis does not reconstruct completely after 11 years from the accident even at full reconstruction their morphological structures especially among the persons of higher radiation risk from the point of view of oncohematology pathology. This fact is a base for appearance in their wrong reply on the influence hemopoietic growth factors.

Dynamic observation for the distribution of leukemias and lymphomas among children and adult population for period after Chernobyl accident is not excited their increase. Although among clean-up workers IV-VII 1986 from 800 m zone in the region of NPP is marked the tendency for increasing of radioinduce oncohematology pathology (leukemias, lymphomas, MDS).

In general, at the comparison of dynamics of changing expansion of general classes of diseases in injureds as a result of Chernobyl accident for period 1986-1996 and analogous data on Ukraine it can noted the authentic increase diseases of digestive and nervous systems.

A dynamic of health changing of children living on the contamination territories for the pointed period is characterized with continues negative tendencies. A percentage children in good health is decreased from 27% in 1986-1987 years to 8% in 1996 and a quantity of children with chronic diseases increases.

At present integral characteristic of the health state of clean-up workers children is few distinguished from control group on the analogous indexes. At the same time increase hematological diseases at the expense of anemias, agranulocytosis, increase of lymphonoduses, nasal hemorrhage is notified. Allergic component is the base of chronic inflammation of nasopharynx and respiratory diseases. Mental status of children is decreased at the expense of disorders in perclive sphere. Intellectual and reproductive functions are developed all the better in comparison with control group. It is pointed on the necessary experiences of using ready algorithms. This dissociation in the health indexes is pointed on the necessary of analytic analyses of qualitative variations of health in clean-up workers with definite doses of irradiation children.