# DECEITFUL ASSESSMENT OF THE CHERNOBYL DISASTER: ENOUGH!

## PROFESSOR YURY BANDAJEVSKI, PRESIDENT OF THE ECOLOGY AND HEALTH CENTER OF KIEV, RESPONDS TO THE INFORMATION WHICH APPEARS IN THE LAST ASSESSMENT OF THE UNITED NATIONS SCIENTIFIC COMMITTEE ON THE EFFECTS OF ATOMIC RADIATION (UNSCEAR) PUBLISHED BY THE AGENCY REUTERS ON SEPTEMBER 22ND, 2010[1]

When assessing the humanitarian consequences of the accident at the Chernobyl nuclear power plant in 1986, we must take into account the pronounced effects of radionuclides, primarily Cs-137, on the human population of the European part of the former Soviet Union since the 1960-ies [2].

An analysis based solely on the quantity of radionuclides that entered the biosphere after the Chernobyl accident is unfounded. This completely ignores the previous events, more than 20 years earlier, which also contaminated the population.

Cs-137 radionuclides, penetrating the human body, are incorporated in vital organs, with varying degrees of severity [1]. In such cases, the cells become dystrophic and necrobiotic changes which bring about primarily the dysfunction of energy mechanisms which in turn perturb vital body functions. The severity of the damage is directly dependent on the number of Cs-137 incorporated in the body and in the individual organs [5, 6, 8, 9, 10, 11, 13].

As far as radioactive elements are concerned (gamma and beta radiation from the decay of radionuclides), the amount of Cs-137 contained in the body of people living in areas contaminated by radionuclides as from the 1960's, can be dangerous, especially as inducers of mutations in the genetic apparatus of sexual and somatic cells.

The ability of Cs-137 to cause mutations in germ cells, will, in future generations, be the cause of the appearance of intra-uterine death of the fetus, congenital malformations, diseases of the fetus and newborn babies and diseases of adults associated with lack of gene activity.

This internal irradiation of the organism is also extremely dangerous because this is combined with the ability of Cs-137 radionuclides, as well as their decay products in the form of barium, to affect the biological structure to interact with the receptor apparatus of the cell membrane, and to change the regulatory processes. A striking example of this is the violation of biophysical processes of the cell membranes of cardiomyocytes under the influence of this radionuclide, based on changes of ionic permeability. This leads ultimately to a breach in the conduction of electrical impulses in the heart [5, 8, 9, 10, 11, 12].

A link exists between the frequency of cardiac activity disorders in children and the amount of radionuclides in their organism. We should pay particular attention to the fact that the presence of even relatively small amounts of Cs-137 in children from 10-30Bq/kg (then in

[1] http://af.reuters.com/article/energyOilNews/idAFLDE68L14M20100922

heart tissue concentration of this radionuclide is much greater) leads to a doubling in the number of children with electrocardiographic disorders [5, 7, 12].

In our view, the explanation of this phenomenon lies in understanding the existence of regulatory processes in humans and animals, including, regulation of gene activity. In this regard, environmental factors that inhibit the function of systems that regulate (stimulate) the activity of the cells genetic apparatus, will become inducers (generators) that increase the occurrence of many diseases.

In relatively small amounts Cs-137 is capable of inhibiting the activity of regulatory systems, and above all, the immune system. However, in the presence of genetic defects, distorted processes of realization of genetic information in the form of changes in the antigenic landscape on cell membranes, lead to disrupted cell functioning and differentiation. This creates the basis for the emergence of specific pathological processes, including cancer, cardiovascular diseases and malformations.

This hypothesis has been confirmed by the results of research conducted by staff of the French scientific center IRSN which, in experimental animals, revealed the ability of radionuclides Cs-137 to alter genes expression in myocardium cells [14].

The fact that Cs-137 radionuclides, since the sixties, have an effect on the population in the Republic of Belarus, the Baltic countries, Russia and Ukraine, from 1960-ies [2], explains the high incidence of disease due to damage to the cell genome, especially that of malignant neoplasms. This mutagenic effect is confirmed by medico-genetic studies [3,4].

Following the Chernobyl nuclear power plant accident in 1986, the intake of radioactive elements in the human organism has contributed to the rapid development of neoplasmic processes, which, above all, destroyed the regulatory processes that ensure the functioning of vital organs and systems in a genetic disadvantage. A clear illustration of this conclusion is the occurrence of thyroid cancer in young people and children five to six years after the explosion at the Chernobyl nuclear power plant. Further illustration is the huge rise in the incidence of cancer of the organs that actively incorporate Cs-137. The radiometric study autopsy material held in the Gomel State Medical Institute (1990-1999), have shown the pronounced ability of the thyroid gland in children and adults to incorporate radionuclides Cs-137 [1]. There is a strong correlation between the frequency of the occurrence of thyroid cancer and the contamination density of Cs- 137 according to territory of residence of the population [15].

Contrary to scientific predictions based only on the study of external radioactive effects in genetically stable individuals, in real life situation manifested a monstrous effect of radionuclides Cs-137 in respect of the human population in contact with them for over 40 years. The impact of radionuclides Cs -137 on the human population of the European part of the former URSS during the period from 1960 to 1985 has laid the foundation for the emergence of pathological processes in the post-Chernobyl period (malignant neoplasms, including thyroid cancer, pathology of the cardiovascular system, congenital malformations), taking into account the effects of radionuclides from Chernobyl. Thus, we can rightly consider the Cs-137 as:

1) a source of the mutation process in somatic cells, which is one of the main reasons for the growth of malignant diseases;

2) a source of mutational processes in germ cells, which is the basis for the pathological processes of antenatal and postnatal development of future generations.

3) a factor, which violates the energy processes in the cells of vital organs, resulting in:

a). in relatively small doses (20-30 Bq/kg); a breach of the regulatory processes in the body. This contributes to the emergence of pathological processes and diseases. This emergence is based on the latent genetic predisposition due to mutagenic action, including the same Cs-137, on gametes of the parental generation (deregulator effect of Cs-137).

b) in large doses (>50 Bq/kg); the development of necrobiotic changes in the tissues which have incorporated these radionuclides which has in turn destroyed their energy system.

This, in our view, is the main reason for the increased frequency of many diseases of the population living in areas affected by the accident at the Chernobyl nuclear power plant.

The demographic situation in areas affected by the disaster at the Chernobyl nuclear power plant is now catastrophic. The death rate is several times higher than the birth rate. In the Republic of Belarus, the demographic index (the difference between fertility and mortality) has shown negative values since 1994, representing in 2005, -5.9%0 [16, 18-20]. A similar situation has been observed in most regions of Ukraine that have been affected by the Chernobyl nuclear accident. For example, the mortality in the sector of Ivankov, close to the Chernobyl power plant, amounted to 30,3%0 in 2005, whereas, in the same year, it was 18,3%O in the region of Kiev [17].

The increased mortality has been closely associated with cardiovascular disease and malignant neoplasms, which have increased steadily each year. [16-20]. The decline in fertility is due to a dysfunction of male and female reproductive systems, which induce pathological fetal development.

In view of these elements it is not possible to be in agreement with the conclusions of UNSCEAR.

On the contrary, there is serious concern about the complicated radioecological situation in the territories affected by the Chernobyl nuclear power plant. The main danger to human health comes from cesium-137 and strontium-90 radionuclides that enter the body through food.

Accordingly, the potential victims of the Chernobyl disaster are the residents of contaminated areas in Belarus, Ukraine and the Russian Federation, in which the body every day for several decades, has received radioactive elements.

Necessary objective information and appropriate measures to ensure the protection of the health of people exposed to chronic radiation impact are needed.

In this regard, the main goal of the Centre for "Ecology and Health", established in Ukraine, is to inform the international community about the situation in areas affected by the Chernobyl nuclear power plant. The Centre also seeks to coordinate the efforts of doctors, ecologists, economists, industrialists, politicians etc. as well as to develop a set of measures aimed at ensuring the safety of people living in the contaminated areas.

The project, entitled "Integrated Model of livelihoods in the area of radioactive contamination", (http://chernobyl-today.org/) aims to coordinate the efforts of the international community to devise measures for the population to live safely when exposed to

radiation in one of the most highly contaminated areas of Ukraine. The lessons learned in the region will subsequently be disseminated to other contaminated areas.

The main objective of the project is to establish an effective model of livelihoods in conditions of radiation exposure as a way of improving the demographics and the health of the people living in areas affected by the Chernobyl disaster. The project is based on the principles of collective and individual radiation protection of population.

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