Nuclear denotation: A topic for global public health concern

Sir,

In mid of March 2011, a big Tsunami attacked Japan and caused serious destruction. In addition to the destroyed infrastructure, disruption of the nuclear plants occurred and this is the origin of the big problem of nuclear denotation which is of present concern. Nuclear denotation is an actually interesting new problem that affects a large group of world population. This situation is new and requires our attention in a global level. In this article, the author summarizes and discusses this important topic.

Nowadays, it is widely accepted that there are many natural disasters. Earthquakes, floods and tsunamis are very common in the present decade. Usually, any disaster causes severe loss. In mid of March 2011, a big earthquake occurred in the Pacific Ocean next to the Japanese coast and it generated a big tsunami attacking several seashore communities of Japan.[1] This caused thousands of deaths and massive destruction of infrastructure. It caused a loss worth millions of US dollars.[2]

However, this specific natural disaster led to an interesting consequence which has never happened before. In addition to the destroyed infrastructure, the disruption of the nuclear plants has occurred and this is the origin of the big problem of nuclear denotation which is of present concern. The widespread nuclear particles from disrupted nuclear plants have become a big issue in the present day. The nuclear denotation is an actual interesting new problem that affects a large group of world population. This situation is new and requires attention in a global level. In this article, the author summarizes and discusses this important topic.

“Nuclear” is a new term that human beings have known for just less than a century. The first evidence on the health effects of nuclear power came after the atomic bombing of Japan that led to the cessation of the World War II. This episode caused several deaths and many health disorders to the survivors.[3,4] Of several interesting problems, a long-term follow-up showed that the incidence of cancer is significantly increased in the survivors from atomic bombing.

However, this is the only evidence of the side effects of nuclear weapons. In the past decades, nuclear power had changed into clear power as the source of peaceful energy in many countries. Many nuclear plants have been set up in many countries such as USA, Russia and Japan. First, it was believed that the nuclear plants were safe and there were many protocols to warrant the safety. Many reports confirmed that the people around the atomic nuclear electricity plant had no risk.[5,6] However, the problem of nuclear denotation finally occurred.

The problem of leakage is a serious concern of the radiation hazard. The most famous episode is the explosion of the atomic nuclear plant in Russia. This episode is called Chernobyl crisis (April 26, 1986).[7,8] Nadezhina reported on his experience in organizing medical care for the victims of the accident and proposed that therapy of such patients should be developed along the following lines: 1) prevention and therapy of infectious complications; 2) blood cell substitution therapy; 3) bone marrow transplantation; 4) detoxicating therapy; 5) correction of water–electrolyte metabolism; and 6) therapy of local radiation injuries.[9]

There are many interesting reports on the health effects caused in the population affected by this crisis. Changes in the indicators of bone marrow and blood were reported among the affected cases.[10] A significant change in thyroid gland was also observed and this was the warning sign of the nuclear denotation induced thyroid cancer.[11,12] On the carcinogenesis process, Yarlin et al. said, “It has been proposed that radiation alters the function of thymic epithelial cells by direct action and/or through indirect mechanisms including participation of autoantibodies. The observed complex of alterations is similar to that in the normal process of immunological aging”.[13]

The present Japanese nuclear denotation crisis can be one of the serious nuclear accidents in the human history. Until now, the leakage of the radiation has not been controlled. Contamination of aerosols, water as well as foods from Japan with radioactive particles is continuously being reported. There is no doubt that there should be a good preparedness to this episode.

Avoidance of visiting to the disaster area is required. It is also recommended to avoid using any food or other products originating from the affected area. A close observation of the reported radiation contamination in the atmosphere in the nearby area is recommended. Potassium iodide prophylaxis might be useful in prevention of cancer induction by contaminated radioactive material.[14,15] Finally, after the successful control on the leakage, remediation of land contaminated by radioactive material residues is required.[16]

Continuous monitoring of the health effects among the affected population is required. In the area with reportedly high level of radiation, a long-term follow-up of the blood parameters and occurrence of cancer, especially thyroid cancer, is recommended.

The big earthquake crisis of March 2011 in Japan has led to nuclear denotation which has necessitated public health preparedness to fight with the leakage of the radioactive material.
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