Iran. J. Radiat. Res., 2012; 9(4): 271-273

• *Short note*

Radioactive iodine and radioactive cesium: two important radio-hazard elements in post nuclear power plant crisis

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The present nuclear leakage crisis from Japan is a topic to be discussed in present public health. In radiology, the leaked radioactive elements are considered hazard. Here, the author briefly reviews and discusses on two important radio-hazard elements in post nuclear power plant crisis, radioactive iodine and radioactive cesium. Based on previous similar nuclear crisis in Russia, it is evidenced that the increased incidence of some cancers in post-crisis period is due to exposure to these two important radioactive elements. **Iran. J. Radiat. Res., 2011; 9(4): 271-273**

Keywords: *Radioactive, nuclear crisis, iodine, cesium.*

INTRODUCTION

Recently, a big tsunami attacked to several cities in Japan causing a big disaster. According to this natural crisis, severe destruction of the nuclear power electricity plant occurs. The present nuclear leakage crisis from Japan is a topic to be discussed in present public health. Until present, there is still no successful method to control this nuclear crisis.

In radiology, the leaked radioactive elements are considered hazard. It is no doubt that the radioactive elements can cause several adverse health effects on exposure populations. Here, the author briefly reviews and discusses on two important radio-hazard elements in post nuclear power plant crisis, radioactive iodine and radioactive cesium.

Radioactive iodine

After the occurrence of the present Japanese nuclear crisis, the main focus is on the cancer prevention. There are strong evidences confirming the thyroid carcinogenesis due to exposed to radioactive iodine leaked from destroyed nuclear power plant [1–3]. Similar to non radioactive iodine, the radioactive iodine, iodine 131 (I131), can be absorbed into the thyroid gland of the exposed subjects. This is the basic pathogenesis of several thyroid disorders.

The alteration of thyroid cellular function is reported and the genetic alteration that further induces pre-cancerous lesion development is detectable [4]. Of interest, it is detected that the iodine unsaturated thyroid tissue has a higher absorption of radioactive iodine, hence, it is the basic concept for prevention [5, 6]. Due to the strong evidence, it is suggested to implement the potassium iodine prophylaxis in the areas highly exposed to leaked radioactive elements.

Finally, it should also be noted that the exposure to I131 cause not only malignancy but also non malignancy thyroid disorder [7]. The I131 is reported to alter the normal immune function, T cell, and this can result in the induction of autoimmune thyroiditis [8, 9].

Radioactive cesium

Radioactive cesium is another important radioactive element in nuclear crisis to be concern. The radioactive Cesium 134 and Cesium 137 can result in cellular oxidative disturbance and can cause the problem. Focusing on evidences from Chernobly

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crisis, radioactive cesium is reported to relating to the increased incidence of renal disorder. The situation called "chronic radiation nephropathy" is documented [10-12]. About 1.5 time's increase of renal cell carcinoma incidence was reported [10–12]. Indeed, the accumulation of radioactive cesium in kidney tissues from death cases after Chernobyl crisis is the evidence of renopathological property of this nuclear element [13].

In addition, radioactive cesium is also reported to be an important interference on normal vitamin D metabolism [14]. Hence, the bone problem can be another possible adverse outcome of exposure. However, there is still no clear report on this possible relationship.

Radioactive strontium

In addition to the two well-known radioactive elements, there are also other radioactive elements. Radioactive strontium, Strontium 90, is also mentioned for its adverse effect. Although there is no clear evidence that radioactive strontium is relating to carcinogenesis it is evidenced that radioactive strontium can induce genetic abnormality in lymphocyte [15]. Hence, it might be the element with leukemogenesis property [15]. Of interest, Mangano recently concluded that "The assumption that Sr-90 and childhood cancer are correlated is best supported for a supralinear dose-response, meaning the greatest per-dose risks are at the lowest doses" [16].

CONCLUSION

Due to the nuclear power electricity plant accident, the leakage of several nuclear elements including to radioactive iodine and radioactive cesium can affect the health status of affected populations. The radioactive iodine can be absorbed into normal thyroid tissue and result in both cancerous and non-cancerous thyroid disorder. The radioactive cesium can induce renal disorder. To aware the adverse effect of leaked radioactive elements in the present crisis is very important and long-term following up of the exposed subjects is suggested.

Conflict of interest

The authors report no conflicts of interest.

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