

ASSESSMENT OF THE THYROID PROTECTION EFFICIENCY FOR BELARUSIAN CHILDREN AFTER THE CHERNOBYL ACCIDENT

J. Kenigsberg, E. Buglova

Research Institute of Radiation Medicine, Masharov ave. 23,
220600 Minsk, Belarus

During the acute phase of the Chernobyl accident different countermeasures directed on the thyroid gland protection were carried out. The main measures are evacuation and administration of stable iodine.

Evacuation of more than 12 thousands of Belarusian people from 30-km zone at May, 4-5, 1986 provided relative protection of thyroid glands. Besides that, prohibition for consumption of local milk and leaf vegetables were carried out. As far as this measure was established in a few days after the accident, effectiveness of it in reduction of radioiodine uptake by the thyroid gland was low.

The main countermeasure for thyroid protection of no-evacuated people was administration of stable iodine.

It is known, that taking stable iodine is a measure for reducing the uptake of inhaled and ingested radioiodine by the thyroid (1). For guarantee of complete thyroid gland protection stable iodine should be administrated before any intake of radioactive iodine. The uptake of I-131 by the thyroid decreases by 90% if stable iodine is administrated at the time of intake. The effectiveness of the measure decreases with delay, but the administration after the radioiodine intake provides 50-90% of protection depends on the time of taking stable iodine (2).

In case of situation after the Chernobyl accident the criterion of necessity for thyroid gland blocking by stable iodine were dose levels of intervention, expressed in projected adsorbed thyroid doses for first week after the accident: 300-2500 mGy (3,4). These levels are higher than recommended international intervention levels (5). But it is also suitable in case of conduction in time.

For protect of thyroid gland few millions of tablets of stable iodine were distributed among Belorussian people depends on the distance from the Chernobyl station. But there are some reasons to suppose that only 20% of distributed tablets were used for protection (6). In addition, distribution of tablets was begun some days after the accident.

So, it is possible to conclude, that countermeasures for thyroid gland protection of Belarusian people were conducted not in time, that was reason of low effectiveness of thyroid protection. In this situation population of some regions of Belarus and, first of all, children, received the significant thyroid doses. As a result, during years after the accident it was registered the increase of the thyroid cancer incidence rate for Belarusian children (7).

Among children till 14 years in year of accident who were exposed in Gomel region of Belarus 217 thyroid cancer cases were registered during 1986-1994. Administration of stable iodine during first hours after the accident allows to prevent approximately no less than 800 and no more than 2 thousands thyroid cancer cases during life among this group of children.

REFERENCES

1. World Health Organization, Guidelines for Iodine Prophylaxis Following Nuclear Accidents, Environmental Health Series No. 35, WHO, Copenhagen (1989).
2. Protection of the Thyroid in the event of releases of radiation. *NCRP Report*, N 55 (1977).
3. Ministry of Health of the USSR, Rep. SP-AES-79, Moscow (1979) (in Russian).
4. Buldakov L.A., Statement on intervention levels of doses for evacuation and thyroid blocking, Institute of Biophysics, Moscow, 3 January 1991.
5. IAEA. Safety Series N 109. Intervention Criteria in a Nuclear or Radiation Emergency. - Vienna 117p. (1994).
6. International Chernobyl Project. Technical Report. Estimation of the Radiological Consequences and Protective Measures. - Vienna, 740p. (1992).
7. Kasakov V.S., Demidchik E.P., Astahova L.N. Thyroid cancer after Chernobyl. *Nature* 359:21-22 (1992).