ASSESSMENT OF AVERTED FATAL CANCER CASES DUE TO LIMITATION OF RADIOCAESIUM INTAKE WITH MILK FOR POPULATION OF BELARUS AFTER THE CHERNOBYL ACCIDENT

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After the Chernobyl accident different protective measures for radiation protection of Belarusian population were carried out. As a result, annual reduction of exposure and prevention of significant doses for people of Belarus are registered.

Exposure doses for overwhelming majority of population during all phases of accidental period are conditioned, mainly by the levels of internal doses. For inhabitants of clean and low contaminated territories total doses are formed only by means of internal exposure from consumed foodstuffs, contaminated by radionuclides. For 1.3 million of inhabitants of contaminated territories (with density of radiocaesium contamination more than 37 kBq/sq.m internal doses are higher than external doses in most cases. Only for inhabitants of individual settlements with densities of radiocaesium contamination of territories more than 185 kBq/sq.m, external exposure doses play an important role in total dose formation.

In connection with this, the specific attention during all phases of accidental situation were given to measures, acting to the reduction of internal exposure doses. Internal exposure doses are forming mainly due to radiocaesium intake with ration. Contribution of inhalation component in the total doses of internal exposure is low.

The amount of radiocaesium intake depends on peculiarities of ration structure and caesium transfer by food chain. High specific weight of milk and milk products in daily ration and levels of its radiocaesium contamination are the reasons of main role of milk products in alimentary radioactive intake. As a result of investigation it is known, that for urban and rural population radiocaesium intake with milk can forms 20-24% and 44-54% of total intake with ration correspondingly.

So, establishment of permissible levels for radiocaesium contamination of milk and it revision in the hours of time allows to avert significant part of internal doses.

During intermediate and late phases of accidental situation different permissible levels for radiocaesium contamination of milk were carried out. Since 1986 till 1990 limit for radiocaesium content in milk was 370 Bq/l, since 1991 till 1992 - 185 Bq/l and since 1993 - 111 Bq/l.

Investigation of averted collective doses of internal exposure due to establishment of strict limits in 1990 and 1992 shows the following (table). Averted collective internal dose for urban inhabitants of most contaminated Gomel and Mogilev regions of Belarus forms near 2.2 thousands person-Sv and 1.8 thousands person-Sv correspondingly.

On basis of preliminary estimation it is possible to conclude, that averted collective dose of internal exposure for rural population are similar for those of urban people. But for correct estimation it is necessary to take into account the levels of consumption rate of private milk by rural population. Consideration of this fact can decrease levels of averted internal doses for rural population.

Estimation of averted risks of stochastic effects for urban inhabitants of Gomel and Mogilev regions, that were calculated on the basis of ICRP coefficients, shows that no less than 110 and 88 fatal cancer cases during life and up to 3 cases of genetic disorders among first two generations of descendants of exposed people correspondingly are prevented on a basis of averted doses of internal exposure.

Averted collective dose of internal exposure for urban population of Belarus allows to prevent the probability of occurrence no less than 800 fatal cancer cases and 20 cases of genetic disorders in first two generations.

Data obtained testify that conduction of estimated countermeasure allows to prevent significant part of collective dose of internal exposure and stochastic consequences of accidental exposure for population of Belarus.

Table.

Averted dose of internal exposure and prevented stochastic effects for urban population of Belarus due to establishment of strict limits for radiocaesium contamination of milk.

Region	Averted dose, person-Sv	Prevented fatal cancer cases during life	Prevented cases of genetic disorders in first two generations of descendants of exposed people
Gomel -urban population	2204.6	110.2	2.8
Mogilev -urban population	1758.2	87.9	2.3
Belarus -urban population	16684.0	843.2	21.4