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Hemoblastoses of the Chernobyl Accident Clean-Up Workers and the Population in Belarus

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Abstract. The frequency and structure of hemoblastoses among Chernobyl nuclear power plant disaster liquidators and the population of Belarus are studied. The nosology structure of morbidity are documented; the dependence of the latter on the location of a work place in the hazard zone and of the permanent place of inhabitancy are noticed. No excessive increase of liquidators morbidity levels as compared with the one of the whole population is discovered. However, a certain increase in the last years is determined.

1. Introduction

"Clean-up workers" or "liquidators" of the consequences of the Chernobyl nuclear power plant disaster are a group of a higher risk for oncohematological morbidity. Despite the majority of liquidators are of the age of active ability to labor, a communication already appeared that among the reasons of their primary labor disability the 2nd rank is of oncohematological diseases (after the diseases of cardiovascular system) [1]. Japanese follow up observations of the A-bomb survivors documented that in Hiroshima the excess of leukemia cases appeared after a 5-year period following the A-bombing and in Nagasaki after a 10-year period. It was also demonstrated that the duration of latent period of leukemia is shorter for the cases exposed to ionizing radiation before 30 years of age [2;3].

2. Materials and methods

The data on the Chernobyl nuclear power plant liquidators and on their oncohematological morbidity were obtained by means of screening the two registers; the Republican Register of the population suffered as a result of Chernobyl nuclear power plant Accident and of the Republican Register of blood diseases. The first one contains information of about 63.5 thousand liquidators. That is approximately not more than 50 % of the entire number of persons who worked in the 30 km area from the epicenter of the catastrophe and who, due to various reasons, were registered as regular patients of specialized dispensaries. The comparison of these data with the data of the second - hematological - register made it possible to obtain the most full and verified information about oncohematological cases among liquidators and about the analogous morbidity of the Belarus population (the latter being used as a control group of the present study) as well as of the population of its separate administrative regions.

3. Results

As a result of the screening, 67 liquidators were found to have leukemia or other hemoblastoses. About 79 % of these persons worked in the hazard zone in 1986, 13 % in 1987, the rest in 1988-89. 6 were diagnosed - Hodgkin's disease, true polycythemia etc. - prior to the disaster and these cases were excluded from the further analysis. 61 liquidators were diagnosed at first from May 1986 till 1994 (Table 1).

Table 1. Characteristics of hemoblastoses morbidity among liquidators - Number of cases according to nosologies

Year	LEUKEMIA				LYMPHOMA		
	Acute	Chronic lympho-leukemia	Chronic myelo-leukemia	Erythremia	Multiple myeloma	Hodgkin's disease	Non-Hodgkin's
1986	0	0	0	2	0	0	0
1987	1	0	0	0	0	1	0
1988	2	1	0	1	0	2	0
1989	1	1	0	1	0	1	2
1990	2	2	0	1	0	1	0
1991	4	2	3	0	0	0	0
1992	1	1	3	2	0	0	1
1993	1	4	2	3	1	0	1
1994	1	2	4	0	1	0	2
Total	13	13	12	10	2	5	6

They consist in 8 women and 53 men, 11 rural and 50 urban habitants. The age structure of this group is plotted in Table 2.

When the morbidity of hemoblastoses of the population of the regions of the Belarus is compared with the quantity of the liquidators cases diagnosed in these territories, one is able to suppose that the inhabitants of the Mogilev, Gomel and Grodno Oblasts were sent to work in the comparatively less contaminated zone than the ones ordered to the duty trips from the City of Minsk, Minsk and Vitebsk Oblasts.

Table 2. Age distribution of cases among Chernobyl nuclear power plant disaster liquidators in 1986 - 1994

Number of liquidators	Age (years)						
	19<25	25<30	30<40	40<50	50<55	55<60	=>60
At the moment of work in the zone	7	4	14	17	10	7	2
At the moment of morbidity	3	5	10	16	7	10	10

The revealed in the present study excess of the hemoblastoses levels among the liquidators of the Vitebsk and Minsk Oblasts (Table 3), as compared with the one of the population is associated exactly with the character of their work in the zone and with the radionuclide contamination of the zone of their duties fulfillment, but not with the particularities of the dissemination of hemoblastoses among the Republic and the location of their permanent inhabitancy. This supposition found its confirmation during the following analysis that revealed that the most radiation-dependent nosological forms of hemoblastoses - acute leukemia, chronic myeloleukemia - more often are diagnosed among the liquidators who fulfilled the work in the territories, closest to the epicenter of the disaster: in Chernobyl, Bragin and Khoyniki Raions. It should also be noted [Table 1.] that the hemoblastoses quantity among liquidators is being step-by-step increases with the time lag extension from the moment of the accident.

4. Conclusions

The level of morbidity of various forms of hemoblastoses (leukemias and lymphomas) among liquidators has not exceeded during 9 years after the disaster (1986-1994) the analogous level of the one of the whole population of the Republic of Belarus.

There is a trend of increase of the number of diagnosed cases in the last years.

Table 3. Morbidity levels magnitudes (per 100,000) among the population of Belarus (aged 20-59 years) and the liquidators

Location of inhabitancy	Hemoblastoses	
	among the population	among the liquidators
Minsk City	16.1	16.1
Brest Oblast	13.8	11.3
Vitebsk Oblast	14.9	19.5
Gomel Oblast	13.3	7.9
Grodno Oblast	14.5	4.5
Minsk Oblast	15.9	22.6
Mogilev Oblast	14.8	2.6
In the Republic of the Belarus in toto	14.8	10.7

5. References

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