Health conditions among workers who participated in the cleanup of the Chernobyl accident

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In Kyrgyzstan, the health status of the people who were exposed to radiation from the Chernobyl accident and took part in the cleanup (or "liquidation") of the site has been monitored since 1991. Clinical observation of children born in families of the cleanup workers ("liquidators") of the accident consequences after their return from the accident zone began in 1992. For the last two years medical care has been provided for all the people who were in other radiation disaster zones (Semplalatinsk, Chelyabinsk region, etc.), and a special 3-level registry has been established for these patients.

In 1992, the Interdepartmental Board of Experts, a government agency, was established for the evaluation of diseases and their relation to the work done in the zone of high-level radiation, in those persons who had been subject to radiation effects after the Chernobyl accident. The staff of the Board consists of medical specialists from different fields and representatives of social security, trade unions, and the Union Chernobyl public organization. Professor Z. Kamarli was appointed Chairman of the Board.

By 1 January 1995, 2 093 people including 407 children born after their parents' work in the Chernobyl accident zone, were being followed up through the registry. In addition, 24 evacuees including 7 children from the Chernobyl accident zone, 3 persons who had resided in the Techa River basin in Chelyabinsk province ("oblast") for a long time, and 3 servicemen who took part in the nuclear tests in Totski, Orenburg province, were also registered. At present the number registered is approaching 3 000, mainly due to improved registration in the south of the republic.

In Kyrgyzstan, uranium has been mined in a number of regions, and radioactive waste deposits are found around these populated areas. Moreover, some towns and villages bordering China have been subject to the effect of radioactive dust during the nuclear tests at Lob Nor. Considering these circumstances, an increase in the number of people likely to be registered can be expected. Moreover, there is no regular, clinical examination of the population in those regions, chiefly because of financial difficulties and the absence of the only programme which aims to lessen the severity of radiation consequences.

Nevertheless, in the current year, with the financial support of our partners from the Kansas University Medical Center (United States of America), medical examinations of the residents of Mailuu-Suu town in the south of Kyrgyzstan were carried out. Around this town there are about 20 waste deposits maintained without due precautions. Nearly 5 500 people including 2 100 children were examined.

The preliminary results of this study showed that among people who considered themselves healthy more than 50% of the adults and 38% of the children suffered from various diseases. Medical care was provided for some of these newly discovered patients.

Of 1 688 adult patients included in the registry, 1 584 (94%) have undergone a prophylactic medical examination. Of these, only 627 (39.6%) were healthy, the rest (957 or 60.4%) had various diseases and needed medical treatment.

An analysis has shown that the number of patients among Chernobyl accident cleanup workers increases each year (from 54.5% in 1991 to 60.4% in 1994) and that the number of invalids among them increases in an almost geometrical progression (from 2.3% in 1991 to 20.6% in 1994). This indicates serious disorders in the organisms of people who were subjected to radiation effects while working in the accident zone. These disorders result in disability, despite the therapeutic measures applied each year. However, it cannot be denied that there are shortcomings in the medical care dispensed to these patients.

Fig. 1 shows the increase in number of diseases in the followed-up population. When comparing these data with corresponding figures for the republic as a whole, it was observed that the incidence rate among the cleanup workers of the Chernobyl accident site was nearly 3 times that in the rest of the population, although the rate of increase of the morbidity rate among the cleanup workers showed a tendency to slow down. However, a significant improvement in registration, especially in the south of the republic, is likely to result in an apparent increase in the followed-up population.

Fig. 2 shows the incidence rate of various disorders among the cleanup workers and a comparison
7 times higher than in the rest of the population. For diseases of the digestive system, the incidence rate is 5.6 times higher among the cleanup workers than in the general population.

Disorders of the endocrine and immune systems occur rather often in persons subjected to irradiation. These disorders occur more than 18 times more frequently among the cleanup workers than in the rest of the Kyrgyz population.

Cancer has been detected nearly 4 times as frequently in those subjected to irradiation as in the population as a whole.

Analysis of mortality rates (Table 1) during a 3-year period shows that suicides were the most common cause of death among people exposed to radiation. About a quarter of all deaths were suicides, and if we were to consider the taking of massive doses of alcohol as a type of suicide, then this figure would increase still more.

Owing to the impossibility of calculating precise, individual doses of radiation, it may be assumed that the morbidity was caused by small doses of ionizing radiation. The psychosocial stress effects, manifestations of which are various and latent for a long time, are added to that. The treatment has a temporary and sometimes very slight effect, making it necessary to search for new ways to provide therapy and rehabilitation for these followed-up patients.

In Kyrgyzstan, there is significant experience in therapy and rehabilitation of patients using alpine climatotherapy, a method known for its effectiveness. Thus, the alpine base at Tuya-Ashu (3200 m above sea level) was used jointly with the Institute of Cardiology from 1992 through 1995 for the rehabilitation of the Chernobyl accident cleanup workers. The course of treatment lasted for 24 days. Considering that only 20 patients received such treatment, so far it is too early to draw a conclusion. However, the positive influence of high-altitude climatotherapy on the functional indicators of the respiratory, cardiovascular and immune systems has been observed.

**Conclusions**

1. The establishment of the registry of persons subjected to radiation contributes to the detection of illness among them, and their timely treatment.

2. The registry data for Kyrgyzstan show that morbidity among the observed population is increasing. Diseases of the nervous system are most frequent, followed by diseases of the digestive, respiratory and endocrine systems. The immune system is very often affected, too.

3. The mortality rate among cleanup workers of the Chernobyl accident site is high. Suicide is one of the main causes of death in this population.
Table 1
Main causes of death among the Chernobyl Atomic Energy Station accident cleanup staff, 1989-1994

<table>
<thead>
<tr>
<th>Cause</th>
<th>Number of deaths – %</th>
</tr>
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<tbody>
<tr>
<td>Suicide</td>
<td>16 – 23.2%</td>
</tr>
<tr>
<td>Cardiovascular diseases -</td>
<td></td>
</tr>
<tr>
<td>Maladies cardio-vasculaires</td>
<td>12 – 17.4%</td>
</tr>
<tr>
<td>Alcohol poisoning – Alcoolisme</td>
<td>10 – 14.5%</td>
</tr>
<tr>
<td>Cancer</td>
<td>5 – 7.25%</td>
</tr>
<tr>
<td>Other diseases – Autres maladies</td>
<td>26 – 37.65%</td>
</tr>
<tr>
<td>Total</td>
<td>69 – 100.0%</td>
</tr>
</tbody>
</table>

4. High-altitude climatotherapy may become one of the auxiliary methods for the treatment and rehabilitation of people subjected to radiation.

Summary

People who took part in the Chernobyl accident cleanup have been registered upon their return to Kyrgyzstan since 1991, and their children since 1992. Later, citizens affected by the Semipalatinsk and Chelyabinsk contamination incidents were included for registration and health care purposes. The effects of the nuclear waste depositories in the Mailuu-Suu region were examined with the assistance of the Kansas University Medical Center (United States of America).

All these investigations of affected people indicate apparent increases in a number of symptoms and illnesses when compared to the rest of the population. Sample sizes ranged from several hundred to several thousand. Above-normal radiation levels and/or the stress and fear of living in contaminated areas can lead to significant increases in nervous disorders, cardiovascular diseases and other problems. The most significant increase was in the suicide rate.

Résumé

Conditions sanitaires parmi les membres du personnel ayant participé au nettoyage après l’accident de Tchernobyl


Toutes les recherches portant sur des personnes touchées indiquent un accroissement apparent d’un certain nombre de symptômes et de maladies par rapport au reste de la population. Les tailles des échantillons vont de plusieurs centaines à plusieurs milliers. Des niveaux de rayonnement supérieurs à la normale et/ou le stress et la crainte que provoque le fait de vivre dans des zones contaminées peuvent accroître considérablement les troubles nerveux, les maladies cardio-vasculaires et autres. C’est le taux de suicide qui a augmenté le plus.