

Chernobyl 1996: New Materials concerning Acute Radiation Syndrome around Chernobyl

Vladimir M. LUPANDIN

*Institute of Sociology, Russian Academy of Sciences
Parkovkaya 33-24, Moscow 105215, Russia*

We have already reported that in March and June of 1992 we managed to discover 82 medical histories in the Central district hospital (CRH) of the Khoyniki district of the Gomel region (town Khoyniki) with the description of radiation injury, which emerged in the first days and weeks after the accident at the 4th power unit of the Chernobyl NPP [1]. We have found the symptoms of acute radiation disease in eight cases. A brief account of this fact in the press has caused interest in the Republic of Belarus, the USA and Japan [2, 3].

However, a more elaborate analysis of the data found in the medical documents, compiled by the staff of the CRH in May-June 1986 was hampered by the absence of reliable (not misrepresented) information on the radiation situation in the Khoyniki district in the first days after the accident when, as one might expect, radiation dose could be so strong enough to induce radiation syndrome.

In 1996 we have succeeded in getting reliable data on the radiation situation in the Khoyniki district. These were data of the Civil Defence Headquarters of the Khoyniki district, remaining in private notes of the Chief of the Civil Defence Headquarters (all data have been submitted to the republican archives in Minsk immediately after the accident).

According to the existing practice, all data on the radiation situation in the first days after the accident have been concealed by the USSR Hydro-meteorological Committee, although these data were of the greatest interest in order to assess the scale of the accident. The same happened to the data of the Civil Defence Headquarters of the Khoyniki district: they were concealed by the Belorussian Hydro-meteorological Committee.

However, as we have compared the data on radioactive contamination presented by the Civil Defence Headquarters with the data of the Medical and Epidemiological Station of the Khoyniki district, we found that they coincided to a great extent.

The usual argument to reject the data acquired on local areas has been that measurements were conducted by semiskilled staffs using improperly calibrated devices. However, in our case this argument has no power.

The Chief of the Civil Defence Headquarters of the Khoyniki district - Kayuda Alexander Ivanovitch had

previously worked as a nuclear submarine mechanical engineer. He had been serving in the submarine fleet until 1983. Besides technical maintenance of the nuclear reactor, he was responsible for measurements in the reactor compartment. He has been holding the post of the Civil Defence Headquarters Chief since 1983. Even before the accident, he had been conducting measurements of the radiation background in the 10-20 km distance from the Chernobyl NPP by means of the DP-5V dosimeter. According to his data in June 1985, exposure dose rate on the ground near the village Radin was 240-250 $\mu\text{R/h}$ (the same dosimeter showed only 40 $\mu\text{R/h}$ in the reactor compartment of a nuclear submarine). The enhanced radiation background in the vicinity of the village Radin could not be explained by reasons other than (radioactive) discharge from the Chernobyl NPP.

According to the data of the Civil Defence Headquarters, systematic dosimetric studies were not conducted on the 26th and 27th of April in the territory of the Khoyniki district by any civil or military organisation. The Civil Defence Headquarters started to conduct the first dosimetric studies on the 28th of April at 8 a.m. Below are given some of the results of the ground radiation measurements conducted by the Civil Defence Headquarters:

Town of Khoyniki — 8 mR/h;
Villages: Strelitschevo — 14 mR/h,
Dron'ki — 30 mR/h,
Orevitschi — 89 mR/h,
Borshevka — 120 mR/h,
Radin — 160 mR/h,
Ulasy — 300 mR/h,
Tschemkov — 330 mR/h,
Masany — 500 mR/h.

According to the instruction on population radiation protection existing at that moment, the major part of the Khoyniki district population had to be evacuated because many residents of the district were likely to suffer the whole-body doses of hundreds of rem — such was the conclusion of the Civil Defence Headquarters, announced at the district meeting in the evening of the 28th of April.

The conclusion about the necessity of immediate evacuation of the district residents was supported by the Gomel region Civil Defence Headquarters Chief, D.F. Zhukovskiy (mechanical engineer of special power plants) and nuclear physicists from the Obninsk NPP who were also present at this meeting. The district administration rejected the demand of the

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district and region Civil Defence Headquarters.

However, the evacuation of children and pregnant women from the 30km zone began on the 1st of May, and on the 5th of May the evacuation of the rest of the population. The number of evacuated residents totalled to 5,200 persons. All of them underwent medical examination at the CRH which has been reorganised into a Military Field Hospital (MFH) on the 5th of May. From this day military radiologists from Severomorsk, Severodvinsk and the Far East started to work at the CRH. The official symptoms for stationary examination at the MFH were as follows:

- The exposure dose rate of the thyroid gland is more than 1,000 $\mu\text{R/h}$.
- Contamination of clothing, footwear, skin, underwear is more than 0.1 mR/h.
- Accumulation of radionuclides in internal organs (thyroid gland, liver, kidneys, genitals) from 800 to 1,000 μCi .

Approximately 12 thousand residents of the Khoiniki district came within these factors: all of them have undergone medical examination in the Military Field Hospital (there have been 32 thousand residents in the Khoiniki district before the accident).

Medical histories (approximately 12 thousand) have been stolen from the hospital archive in November 1990. After the loot, the records of the archives have not been kept in order. At the time we started to search for the remaining medical histories, medical files were found to be huddled in a stack in the attic of an ancillary building. As it is already mentioned, we have found 82 medical histories of patients from contaminated territories, who entered the hospital within the period from the 1st of May and till the middle of June 1986. These 82 histories are considered to be only a small part of the total, most of which were stolen from the archive in 1990.

22 medical histories of patients from the Bragin district have been excluded from the present report.

The Military Field Hospital (MFH)

60 medical histories from the hospital archives have been used for a retrospective analysis. All entries in these histories are very brief, reflecting a fact accounted for by both the considerable amount of work and the inspective reasons. The diagnosis at the discharge from the MFH had been subject to especially strict inspection: we have not found a single mentioning of radiation injury.

However, the reasons coming to the hospital for medical examination due to stay in the zone of radioactive contamination were not subject to inspection. The contents of these reasons remaining in their medical histories are of our interest.

Reasons coming to the MFH are as follows:

1. Radiation sickness Grade II.
2. The dose rate of thyroid gland — 10-16 mR/h.
3. Complaints of general weakness, headache, stomach aches, nausea, vomiting, dropsy of lower extremities.

4. Child from radioactive zone.

5. Hospitalisation for medical examination due to stay in the zone of increased radiation and changes in blood tests (leukocytes 2,500 mln/l).

6. Complaints of nausea, vomiting, salivation. Exposure dose rate of thyroid gland is higher than 3,000 $\mu\text{R/h}$.

7. Radioactive contamination. Exposition dose rate of the thyroid gland is higher than 3,000 $\mu\text{R/h}$.

8. Leukocytopenia: leukocytes — 2,300 mln/l. Headache.

9. Directed by the primary medical service with radioactive contamination diagnosis. Dosimetric data of the thyroid gland: more than 3 mR/h. Leukocytes — 2,900 mln/l.

10. At the time of the accident the patient stayed within 300 meters from the Chernobyl NPP. Leukocytopenia: leukocytes — 3,200 mln/l.

11. Radioactive contamination: liver 5-10 mR/h. Thyroid gland — 1.5 mR/h.

12. Radiation burn of face and hands.

13. Radiation injury, nasal bleeding.

Apart from the reasons coming to the MFH, complaints of the patients about their health state are also of interest. The following complex of symptoms was found most frequently: headache, strong weakness, nausea — more than 30% of the total number of patients. These symptoms are typical of so-called vegeto-vascular dystonia (VVD).

Second was the complex of symptoms characterised by vomiting, stomach ache, dizziness, poor appetite, pains in the heart area, dry and bitter mouth — up to 10%. Neurocirculatory dystonia (VVD + pains in the heart area) — 13%.

Below is given the list of patients' complaints found in the medical histories:

- Headache — 33 cases,
- strong weakness — 29,
- nausea — 20,
- dizziness — 10,
- pains in the heart area — 8,
- vomiting — 7,
- poor appetite — 7,
- dry and bitter mouth — 7,
- salivation — 3,
- arthralgia pain — 3,
- scratchy feeling in the throat — 3,
- drowsiness — 2,
- diarrhoea — 2,
- disturbed sleep — 2,
- pains in the right subcostal area (liver) — 2.

The following complaints have been registered only once: increased temperature, defecation and urination retention, retardation, nasal bleeding, vascular bleeding, ear noise, skin itch, sweating, dry cough.

The patients were coming from the following residential areas: Towns: Khoiniki, Pripjat. Villages: Borshevka, Orevitschi, Ulasy, Pogonnaya, Molotschki, Kazhushki, Dron'ki, Chvoshevka,

Tschernobyl, Veliki Bor, Vysokaya, Budovnik, Novoselki, Lomatchi, Maleshev, Novopokrovka, Klivy, Amel'kovstchina, Erapov, Pudakov, Tul'govjtchi, Veletin, Tchechi, Dvorishtche, Rudnoe.

As a result of a retrospective analysis of 60 medical histories, the cases have been divided into three groups:

1. Acute radiation syndrome (ARS).
2. Radiation reactions.
3. High exposure dose rate of the thyroid gland without clear clinical symptoms.

Radiation Syndrome

1. Krychenko Nikolay Alekseyvitch (fictitious), man, age: 20, worker, from the village Borshevka.

Time of admission to the CRH: the 1st of May, 2:00. Complaints by admission: recurrent vomiting, general weakness, abdominal pains (in epigastrium area, mainly left), headache, bitter mouth.

History: the patient came to the village Borshevka to his relatives, intending to get sun-tanned and fishing in the river Pripyat. He spent two days — 26th and 27th of April on the bank of the river Pripyat. On the 28th of April vomiting came (up to six times a day), nausea, abdominal pains, the temperature rose (to 39). Stool retention was observed. The patient took antidote according to the direction of a physician.

Results of medical examination: retardation, flaccid. The tongue was coated with white fur. Stool retention for three days. Temperature — 36.6.

Radiation gamma background (!): clothes were strongly contaminated. Gamma dose rate from the side of the liver — 1.5 mR/h.

Medical examination on the 1st of May at 5:30 a.m. The patient complained of general weakness, nausea, vomiting (once since admission to hospital), retention of urination and constipation. Health state of the patient in the afternoon of the 1st of May: confused speech, complaints of headache, dizziness, recurrent vomiting. Blood analysis: leukocytes — 3,600 mln/l, trombocytes — 260,000/ml. Analysis of urine: protein — 4.65 g/l.

The patient was transferred to the Gomel regional hospital on the 3rd of May.

Additional data. On the 29th of April he was examined by the Medical Service Chief of the Civil Defence Headquarters, V.I.Kobylko: confused speech, complains of headache, weakness, recurrent vomiting. The patient conveyed that he had come to get sun-tanned and fishing in the river Pripyat on the 26th and 27th of April. He was subject to a second medical examination at the CRH on the 1st of May: the patient was still in an emergency state: retardation, confused speech. Diagnosis: Grade II-III ARS.

The village Borshevka, where the patient had come, is situated at 17.5 km to the north of the Chernobyl NPP on the right bank of the river Pripyat. Number of inhabitants on the 1st of January 1986 — 311 persons.

Radiation measurements in the village Borshevka.

The data of the Khoyniki district Civil Defence Headquarters: the exposure dose rate on the ground in the village Borshevka on the 28th of April was 120 mR/h. Air measurements on the 20th of May; 300 meters above the village Borshevka — 28 mR/h; on the ground — 50 mR/h.

The data of the Khoyniki district Medical and Epidemiological Station: on the 29th of April 1986 the exposure dose rate on the ground in the village Borshevka was 60-100 mR/h, Sr-90 — 13.4 Ci/km².

The clinical characteristics of the disease corresponds to Grade III ARS: the irradiation dose, apparently exceeds 300 rem. The patient had received the main dose of ionising irradiation within two days — 26th and 27th of April, which testifies to the fact that during these two days there was a very high radiation level in the area of the village Borshevka. As the radiation level on the ground on the 28th of April has been 120 mR/h, one can draw a conclusion that the high level of ionising irradiation was contributed by short-lived radionuclides.

The severity of radiation injury was determined not only by high irradiation level, but also by the fact that the patient was getting sun-tanned (there weather was hot). One can presume that there were many people taking vacation on the bank of the river Pripyat during the weekend (26th and 27th of April). We can state that during these two days high irradiation doses could be received by the people far outside the Khoyniki district, especially by those who were getting sun-tanned, took outer clothes off due to hot weather, spent much time in the open air.

2. Medical history N2505/467. Man, resident of the village Borshevka, milker, age: 47, works in the collective farm "Pervoe Maya" (The First of May). Admitted to the CRH on the 2nd of May, 2:45. Directed by the head physician of the Pogonyansk rural hospital. Diagnosis: Grade II ARS.

By admission the patient complained of nausea, vomiting, weakness, abdominal pains. He said that he had fallen ill on the 1st of May, when pains in epigastrium area, nausea and vomiting came.

Medical examination on the 2nd of May, 16:30. Vomiting did not recur. Health state improved. Abdomen painful.

Blood analysis: leukocytes — 4,700 mln/l. The patient left the hospital on the 4th of May without official permission.

3. Medical history N7539/464. Man, age: 82, resident of the village Borshevka. Admitted to the CRH on the 3rd of May 1986. Complaints of general weakness, headache, abdominal pains, nausea, vomiting. Dropsy of lower extremities was found by evening. The patient left the hospital on the 4th of May.

4. Medical history N2520/476. Woman, age: 48. Admitted to hospital on the 3rd of May from the village Molotchki.

First symptoms of an ailment became apparent on the 28th of April 1986: nausea, vomiting, strong general weakness, diarrhoea (up to 4 times a day). The

patient consulted a doctor on the 30th of April.

Medical examination on the 3rd of May: the patient complained of pains in epigastrium area, nausea, vomiting, salivation. 7th of May: the exposure dose rate of thyroid — 3,000 $\mu\text{R/h}$. Blood analysis from the 9th of May: leukocytes — 3,500 mln/l. Discharged from hospital on the 13th of May 1986.

Retrospective analysis:

Grade I-II ARS — might be substantiated by typical clinical symptoms and stay in radiation contaminated area, the exposure dose rate of thyroid and leukocytopenia. The intestinal upsets draw the attention in the health state of the patient.

Clinical symptoms of ARS of the patient became apparent on the 28th of April, which testifies to the fact that on the 26th and 27th of April she received a dose higher than 100 rem.

The patient resided in the village Molotchki (20 km from the Chernobyl NPP, number of inhabitants — 124). According to the data of the Civil Defence Headquarters, the exposure dose rate on the ground in the village Molotchki on the 28th of April was 280 mR/h (two times higher than in the village Borschevka). According to the data of the Medical and Epidemiological Station, the exposure dose rate on the 29th of April was 130-190 mR/h, on the 30th of April — 60-70 mR/h, Sr-90 — 25 Ci/km².

5. Man, age: 35, resident of the village Dron'ki, works in the state farm "Orevitschi".

Admitted to the CRH on the 3rd of May 1986, 20.30. Complaints: weakness, dizziness, nausea, vomiting. The patient had fallen ill on the 28th of April, when the symptoms (weakness, nausea, vomiting) appeared for the first time. These symptoms remained for a week (from the 28th of April to 2nd of May). The health state worsened on the 3rd of May.

Data of medical examination on the 3rd of May: the patient shows slight retardation, he said that he had received a dose of 60 rad.

Discharged from hospital on the 6th of May. The village Dron'ki (35 km from the Chernobyl NPP, 232 residents). According to the data of the Civil Defence Headquarters, the exposure dose rate on the 28th of April was 30 mR/h, and according to the data of the Medical and Epidemiological Station on the same day — 26-28 mR/h. Sr-90 — 2.7 Ci/km².

6. Medical history N8977/438. Man, age: 55, resident of the village Amel'kovstchina. Admitted to hospital on the 10th of May. The patient had fallen ill on the 4th of May, when general weakness, abdominal pains, diarrhoea, nausea, vomiting appeared.

Patient complaints: diarrhoea, abdominal pains, weakness. Blood analysis: leukocytes — 3,200 mln/l.

7. Medical history N8302/602. Woman, age: 57, village Klivy (70 km from the Chernobyl NPP). Admitted to hospital on the 11th of June due to stay in radiation contaminated zone. She had been ill for 1 month. Complaints: pains in the right subcostal area, nausea, vomiting, dizziness, general weakness, abdominal pains, pains in the back, neck, feet.

20th of May: vomiting once. Blood analysis from the 10th of June: leukocytes — 2500 mln/l, trombocytes — 260,000/ml, erythrocytes — 3.63 mln/ml. Arterial pressure 210/115.

8. Medical history 7588. Infant, age: 2 years and 7 months, village Pogonnoye. Admitted to the hospital on the 4th of May. Diagnosis: aphthous stomatitis, a child from the zone of increased radiation. Complaints: refuses to take food, salivation. Objective signs: dropsy lips, profuse aphthous ulcers on the mucosa of mouth, lips and cheeks. Marked salivation, temperature 37.8.

6th of May: stomatitis remained. The patient was transferred to the regional children hospital.

The village Pogonnoye (1,503 inhabitants) lies at 27 km from the Chernobyl NPP (the exposure dose rate on the 28th of April, according to the data of the Medical and Epidemiological Station was 30-35 mR/h, Sr-90 contamination density — 10 Ci/km²).

We have attributed this case to radiation syndrome, although vomiting is not apparent with the patient. The aphthous stomatitis can be explained as beta-injury. The refusal to take food, increased temperature and profuse salivation indicate the severity of the health state.

Let us draw some conclusions. The patients stayed in the radiation contaminated areas and received a relatively high dose of ionising radiation. Similar clinical symptoms appeared in all the patients, which are characteristic of ARS. The patient Krivenok takes a central place in our list: his case may be called a standard ARS case for the 30 km zone.

Radiation Reactions

The following syndromes have been established:

1. Hemopathology — cytopenia, leukocytopenia.
2. Astheno-vegetative syndrome.
3. Neurocirculatory dystonia.
4. Syndrome of laryngitis.
5. Beta-injury of the mucosa and skin.
6. High gamma radiation of the thyroid gland

Leukocytopenia

9. Medical history N7784. Woman, age: 65, resident of the village Amel'kovstchina, admitted to hospital on the 12th of May. Diagnosis: radioactive contamination. Measurement on the 15th of May: clothes — 500 $\mu\text{R/h}$. Thyroid gland — 1,200 $\mu\text{R/h}$. Blood analysis: leukocytes — 2,200 mln/l. Discharged from hospital on the 20th of May 1986.

10. Medical history N8011/554. Man, age: 21, town of Khoyniki. Admitted to hospital on the 23rd of May with the diagnosis: "Hospitalised for medical examination due to stay in increased radiation zone, with changes in blood analyses."

Blood analysis: leukocytes — 2,500 mln/l. Radiation of the thyroid gland — 130 $\mu\text{R/h}$. Treatment according to the scheme used by Grade I ARS: gluconat calcium, citric acid, multivitamins, hypotisiad, mineral water, isophenin, cholagogue medicines.

Discharged from hospital on the 2nd of June.

11. Medical history N8318/604. Man, age: 41, town of Khoyniki, driver. Admitted to hospital on the 13th of May. Radiation from the side of the liver — 80 μ R/h, of the thyroid gland — 35 μ R/h. Blood analysis: leukocytes — 2300 mln/l, trombocytes — 144,000/ml. Complaints: headache.

12. Medical history N7641/318. Woman, age:33, resident of the village Pogonnoye, from the zone of contamination. Complaints: moderate headache, dry and bitter in mouth on May 6. Blood analysis: leukocytes - 2,200 mln/l on May 7. The exposure dose rate of thyroid -1,400 μ R/h.

Vegetative-vascular dystonia

13. Medical history N7868/533. Man, age: 64, resident of the village Ulas, worker on the collective farm "Novaya Zhizn" ("New Life"), resettled on the 5th of May to the village Strelitshevo.

Admitted to the CRH on the 20th of May 1986. Complaints by admission: general weakness, sleepiness, discomfort, pains in the loin.

Directed by the medical service station with the diagnosis: radioactive contamination. Hospitalised from increased radiation area. Dosimetric examination of the thyroid gland: 1.9-2.0 mR/h. Gamma-radiation intensity on the thyroid gland by admission to the CRH higher than 2 mR/h. Blood analysis: leukocytes — 2,900 mln/l. Discharged from hospital on the 5th of June 1986. From the 26th of April till the 5th of May, the patient stayed in the village Ulas, where the exposure dose rate on the 28th of April has been 300 mR/h. From the 5th of May to the 15th of May the patient stayed in the village Strelitshevo.

14. Medical history N7805/496/539. Woman, age: 63, resident of the village Novoselki. Admitted to the CRH on the 13th of May. Diagnosis: radioactive contamination. Exposition dose rate: liver — 1,000 μ R/h, thyroid gland — 3,000 μ R/h. During three days (10-12th of May) the patient stayed in the open air in a 65 km distance from the Chernobyl NPP.

Complaints: headache, nausea, poor appetite, general weakness, discomfort, sleepiness. Blood analysis from the 19th of May: leukocytes — 3,200 mln/l. Discharged from hospital on the 27th of May.

15. Medical history N7795/491. Woman, age: 59, village Novoselki. Admitted to the CRH on the 13th of May. Diagnosis: VVD. The exposure dose rate on clothes on the 14th of May — 700 μ R/h. Thyroid gland — 2,000 μ R/h. Complaints: headache, nausea, scratchy feeling in the throat. The patient stayed within 60 kilometres from the Chernobyl NPP and spent plenty of time in the open air. Discharged from hospital on the 21st of May.

16. Medical history 7818/495. Woman, age: 49, village Novoselki. Admitted to hospital on the 13th of May. Directed to hospital with diagnosis: radioactive contamination. 14th of May: the exposure dose rate on clothes — 900 μ R/h. Thyroid gland — 3,000 μ R/h. Symptoms of an ailment have become apparent on the

10th of May.

Before this, the patient stayed within 65 kilometres from the Chernobyl NPP. Complaints: weakness, nausea, poor appetite, headache. Discharged from hospital on the 21st of May.

17. Medical history N7815/502. Woman, age: 57, village Novoselki. Admitted on the 15th of May. The exposure dose rate on clothes — 700 μ R/h. Thyroid gland — 2,600 μ R/h. Blood analysis on the 19th of May: leukocytes — 2,900 mln/l.

The patient stayed within 65 kilometres from the Chernobyl NPP in the open air. The patient drank milk from her own cow. Complaints: headache, weakness, discomfort, pains in the heart area.

Beta-dermatitis, radioactive burns

18. Medical history N7587/1060. Man, age: 35, resident of the village Veliki Bor. Admitted to the CRH on the 4th of May 1986. The patient was brought from a radiation contamination area with the diagnosis: radioactive burn of the face, hands. Exposure dose rate of the body surface — 300 μ R/h. Thyroid gland — 700 μ R/h. Complains of discomfort, headache.

19. Medical history N7655/461. Woman, age: 43, milker, resident of the village Vysokaya. Admitted to the CRH on the 6th of May, 23:00. Directed with the diagnosis: radiation injury, nasal bleeding. On the 1st-5th of May the patient had worked on cow-milking in the Tchemkov-Ulas area. Headache became apparent on the 5th of May. Objective signs: skin integument of face, neck, hands have the colour of dark sun-tan, reddened cheeks. Blood analysis: leukocytes — 3,000 mln/l. The patient left the hospital on the 8th of May without official permission.

20. Medical history N7794/489/540. Woman, age: 64, resident of the village Novoselki. Admitted on the 13th of May. Directed with the diagnosis: radioactive contamination. The exposure dose rate on clothes — 1,700 μ R/h. Thyroid gland — higher than 3,000 μ R/h. Complaints: headache, nausea, pains in epigastrium area. The patient said that she lived within 60 kilometres from the Chernobyl NPP. The patient worked in the garden. Exposed body parts — sun-tanned. Blood analysis from the 26th of May: leukocytes — 2,800 mln/l. Discharged on the 29th of May.

Neurocirculatory dystonia

21. Medical history N8013. Woman, age: 21, town of Khoyniki. She was working at the Bragin Medical and Epidemiological Station. Admitted to the CRH on the 23rd of May. The symptoms of an ailment had started to become apparent a week before admission to the CRH. The patient repeatedly worked in the areas of increased radiation.

Complaints: sharp pain in the parietal area, nausea, weakness, arthralgia, pains in the heart area, headache, disturbed sleep, anorexia. Discharged on the 2nd of July.

22. Medical history N8060/550. Woman, age: 49,

town of Khoyniki. Admitted to the CRH on the 23rd of May. The symptoms of ailment first became apparent on the 3rd of May: weakness, nausea, subfebrile temperature at night. The health state had worsened on the 20th of May, when the temperature rose to 39.

Complaints: headache, strong weakness, discomfort, poor appetite, nausea, pains in the lumbar area, arthralgia, dry mouth.

23. Medical history N 7806/498. Man, age: 67, village Maleshev (lies on the outskirts of Khoyniki). Admitted on the 14th of May.

Diagnosis: radioactive contamination. The exposure dose rate of the thyroid gland — 1,700 μ R/h. Blood analysis: leukocytes — 2,400 mln/l, trombocytes — 100,000/ml. Complaints: weakness, headache, dull pains in the heart area. Discharged on the 21st of May.

Syndrome of laryngitis

24. Medical history N 7783/512. Man, age: 50, village Borshevka. Admitted on the 12th of May with the diagnosis: radioactive contamination. The exposure dose rate of the thyroid gland — higher than 3,000 μ R/h. Complaints: headache, dry cough, scratchy feeling in the throat. By ENT examination: marked hyperaemia of mucosa. Discharged on the 23rd of May.

25. Medical history N 7785/490. Woman, age: 47, village Nebytov. Admitted on the 13th of May with the diagnosis: radiation contamination. The patient had stayed within 65 kilometres from the Chernobyl NPP. The patient worked in the state farm. Exposed body parts — sun-tanned. Complaints: headache, weakness, itch of the skin, burning in the mouth, dry cough. The exposure dose rate of the thyroid gland — 300 μ R/h. Blood analysis: leukocytes — 2,800 mln/l, trombocytes — 140,000/ml.

26. Medical history N 3637/363. Woman, age: 36, village Pogonnoye. Admitted on the 5th of May. Blood analysis: leukocytes — 3,400 mln/l. The exposure dose rate of the thyroid gland — 1,400 μ R/h. Complaints: aches, scratchy feeling in the throat. Discharged on the 12th of May.

High gamma radiation of the thyroid gland

27. Medical history N 8239/588. Man, age: 57, village Lomatchi, forest worker. Admitted on the 14th of May. Data of the thyroid gland exposure dose rate measurement — 16 mR/h. Complaints: general weakness, bitter mouth, headache. Discharged on the 14th of May.

28. Medical history N 8011/554. Man, age: 21, town

of Khoyniki. Admitted on the 23rd of May for examination from the medical-sanitary field unit with the diagnosis: "radiation level could not be measured (?)". The exposure dose rate of thyroid gland — 13 mR/h. Blood analysis: leukocytes — 2,500 mln/l.

Conclusion

Just a single case (the patient Krychenko) is enough to reject the point of view which the IAEA, the Red Cross, the WHO and other organisations confine to, namely that acute radiation syndrome cases could not have occurred and did not occur outside of the Chernobyl NPP site. However, the case of the patient Krychenko could not have been single. When in the village Borshevka ARS was observed with at least 1% of inhabitants, the same index must be even higher for the villages Masany, Ulasny and others. It is known that 5,200 persons were evacuated from the 30 kilometre zone of the Khoyniki district, while the total number of inhabitants in this was more than 100 thousand persons. As a result we need to expect more than 1,000 cases of ARS.

The obtained data testify to the fact that the highest ionising irradiation levels was observed on the 26th and 27th of April. Over these two days a dose from 100 to 300 rem could have been received in certain conditions (work in the open air, getting sun-tanned).

It has been also found that the number of irradiated persons in the 30 kilometre zone exceeds the number of inhabitants of this district. This is accounted by a significant number of people who came to spend the weekend (26th and 27th of April) in this area.

The fact that irradiation was at its highest on the 26th and 27th of April points to the possible irradiation of a significant number of Belorussian inhabitants, including those, who lived far outside the 30 kilometre zone (in the first place, those who were getting sun-tanned worked in the gardens and spent a long time in the open air). This factor should be taken into account in the analysis of all ailments registered among the Belorussian citizens in April-June 1986 with a number of peculiarities which were not clearly explained so far.

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