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# CONSEQUENCES OF LONG - TERM EFFECTS OF LOW DOSES OF RADIOACTIVE EXPOSURE ON FEMALES WITH ADNEXITIS: HEMATOLOGIC STUDIES

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## Abstract.

Time cause in changes of haematological indices and Cs radioactivity in females with chronic adnexitis was studied. The significant changes in cellular structure of blood were demonstrated in patients with positive analysis on radioactivity (above 1000 Bq/l). Decelerated blood sedimentation rate, increased erythrocytes' anisocytosis (13-15%), decreased level of lymphocytes (18-25%) were revealed in this group of patients.

Radioactive pollution of the territory of the Republic of Belarus is the problem of great ecological importance. Chernobyl accident caused some medical, ecological, ethical and other problems. One of the most important problem is studying the biological effects of low doses of ionising radiation on human health [1]. Out-patients' examination of females from the territories, exposed to radioactive exposure (5-20 Ci/km$^2$ ) defined the relatively high frequency of inflammatory processes of female genitalia. Correlation between the cases and dose of exposure was established [2]. The influence of low doses of radiation on human organism is studied insufficient.

The aim of this work is to examine the influence of low doses of radiation on blood system of females with chronic adnexitis and to evaluate compensatory opportunities of blood system.

We examined 41 patients of reproductive age (age: 20 - 55 ) with chronic adnexitis. Patients were hospitalised from both the regions exposed to radioactive exposure, and from Grodno, which consider to be the «clean» zone, free of radioactive pollution. We examined morphological blood indices and total radioactivity in patients' blood. Hemogramme was made by haematological autoanalisator «System 9020». Radioactivity (Cs-137 and Cs-134) was studied by gamma-spectrometer NTA-1024 (Hungary). According to revealed radioactivity all patients were divided into 3 groups. Group 1 included patients with chronic adnexitis and negative result on radioactivity (n=17). Two other groups (n=10 and n=14) were differed by the level of radioactive Cs in blood ( below 1000 and above 1000 Bq/l). Referent group included donors (n=20).

## Results and discussion.

In patients with chronic adnexitis (group 1) the blood sedimentation rate (BSR) was increased by 2.5 times (table I). The amount of leukocytes was elevated by 42%, lymphocytes - by 23%, monocytes - by 25%, trombocytes - by 16% in comparison with control group. In patients of group 2 (positive analysis on blood radioactivity , below 1000 Bq/l) the BSR, amount of leukocytes and lymphocytes were decreased in comparison with group 1. The most significant changes in cellular structure of blood were defined in patients with chronic adnexitis and positive analysis on radioactivity (total Cs-134 and Cs-137 radioactivity above 1000 Bq/l).

In 50% of patients of that group BSR (2-3 mm/hour) and amount of lymphocytes (18-25%) were decreased, whereas grade of erythrocytes' anisocytosis was increased (13-15%).

Table I.

Hemogramme, performed by hematological autoanalysator «System 9020».

| Blood indices | Norma (donors) | Patients with adnexitis Specific radioactivity | | |
|---|---|---|---|---|
| | | 0 first group | <1000 Bq/l second group | >1000 Bq/l third group |
| BSR mm/hour | 5.0 ± 0.16 | 15.2 ± 0.16 | 7.3 ± 0.19 | 6.4 ± 0.22 |
| WBC x $10^9$/l | 6.2 ± 0.31 | 8.8 ± 0.28 | 7.6 ± 017 | 6.8 ± 0.21 |
| RWC x $10^{12}$/l | 4.6 ± 0.17 | 4.7 ± 0.23 | 4.7 ± 0.31 | 4.8 ± 0.19 |
| HGB g/l | 130 ± 7.8 | 146 ± 5.3 | 133 ± 4.3 | 143 ± 3.2 |
| HCT % | 40 ± 1.2 | 43 ± 1.7 | 41 ± 0.8 | 42 ± 1.1 |
| MCV | 85 ± 3.4 | 89 ± 2.7 | 88 ± 1.8 | 88 ± 2.3 |
| MCHC % | 34 ± 1.7 | 32 ± 0.9 | 35 ± 1.6 | 34 ± 1.2 |
| MCH PG | 28 ± 1.4 | 31 ± 1.6 | 26 ± 0.9 | 30 ± 1.5 |
| RDW % | 11.0 ± 0.4 | 12.3 ± 0.72 | 12.5 ± 0.54 | 13.5 ± 0.39 |
| PLT x $10^9$/l | 205 ± 6.5 | 239 ± 7.8 | 240 ± 10.1 | 250 ± 7.3 |
| Lymph % | 30 ± 1.8 | 37.0 ± 0.93 | 34.2 ± 0.81 | 25.3 ± 1.25 |
| Gran % | 53 ± 2.11 | 54 ± 1.93 | 62 ± 2.36 | 76 ± 3.11 |
| Mono % | 6 ± 0.17 | 7.5 ± 0.25 | 8.1 ± 0.4 | 9.2 ± 0.38 |

Data obtained adjusted with scientific references [3,4]. Authors point the oppression of hemopoesis in condition of long-term influence of low doses of radiation. However, ionising radiation could cause not only the oppression of hemopoesis, but also stimulate the separate components of blood system [5,6]. In patients of group 2 the amount of trombocytes was increased by 17%. In increasing the dose of internal radioactivity ( group 3) the level of trombocytes was elevating by 22%, granulocytes - by 43%, monocytes - by 53%.

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