Medical Follow-up of Persons Accidentally Exposed to 60Co in Bulgaria

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Introduction: A severe radiation accident occurred on 14 June 2011, in an industrial radiation facilities for medical equipment sterilization with very high-acutity gamma sources. Five people were exposed for 5 to 10 minutes to 60Co source (137 TBq). The absorbed doses are 5.63 for Gy for P1 to 1.25 Gy for P5 [6]. We put into practice the plans for medical care provision in radiation accidents and the developed procedures for injury severity assessment, the decision-making algorithm regarding subsequent treatment and therapy of persons affected. The activities performed for initial assessment of the severity of injury of irradiated patients was published in RPD Journal [4]. Based on predictive assessments of the severity of radiation damage, it was decided that the victims required hospitalization at a specialized haematology clinic, where treatment with growth factors to help haemopoiesis recovery was used. The aim of this report is to present the results of one year follow-up of the victims.

Methods: Examinations are conducted by a physician, a hematologist, and a radiobiologist. Hematological tests are performed. Standard laboratory methods are used. Morphological characteristics of different types of blood cells and parallel count of leukocyte components are evaluated macroscopically on blood smears stained with May-Grünewald and Giemsa. The obtained results are compared to the victims' personal reference limits obtained at annual monitoring.

Results and discussion

The patients’ blood analysis results are presented in Tables 1, 2, 3 and 4.

Table 1: Blood analysis of Patient P1 (1/1)

<table>
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<th>Indices</th>
<th>Personal Ref. Limit</th>
<th>n=26</th>
<th>44</th>
<th>48</th>
<th>51</th>
<th>55</th>
<th>58</th>
<th>62</th>
<th>65</th>
<th>69</th>
<th>72</th>
<th>75</th>
<th>76</th>
<th>90</th>
<th>104</th>
<th>118</th>
<th>132</th>
<th>152</th>
<th>176</th>
<th>207</th>
<th>263</th>
<th>275</th>
<th>327</th>
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</thead>
<tbody>
<tr>
<td>PLT(10^9/L)</td>
<td>265 ± 63</td>
<td>220</td>
<td>293</td>
<td>250</td>
<td>267</td>
<td>249</td>
<td>289</td>
<td>273</td>
<td>237</td>
<td>218</td>
<td>244</td>
<td>263</td>
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<tr>
<td>WBC(10^9/L)</td>
<td>6.05 ± 1.05</td>
<td>2.9</td>
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<tr>
<td>HCT (%)</td>
<td>36 - 48</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>36</td>
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</tbody>
</table>

Table 2: Blood analysis of Patient P2 (1/2)

Table 3: Blood analysis of Patient P3 (1/3)

Table 4: Blood analysis of Patient P5 (1/5)

References:
1. BELBT D. KOVALenko A. BEBEVSKO M. Bullous Disease and Tumors in Acute Radiation Sickness Survivors Following the Chernobyl Accident. Third European BPS Congress, Helsinki, Finland. (2010)
3. BEBEVSKO V. ROMANenko A. KOVALenko A. Health Status of ARS Convalescents 18 Years After the Chernobyl Accident. Presented at the 10th Meeting of the REMP, WHO, Stockholm, Russia, 13-15 October (2014)