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Assessment of the Efficacy of Routine Medical Tests in Screening Medical Radiation Staff in Shiraz University of Medical Sciences Educational Centers

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Abstract : Long-term exposure to low doses of ionizing radiation occurs in radiation health care workplaces. Although doses in health professions are generally very low, there are still matters of concern. The radiation safety program promotes occupational radiation safety through accurate and reliable monitoring of radiation workers in order to effectively manage radiation protection. To achieve this goal, it has become mandatory to implement health examination periodically. As a result, based on the hematological alterations, working populations with a common occupational radiation history are screened. This paper calls into question the effectiveness of blood component analysis as a screening program which is mandatory for medical radiation workers in some countries. This study details the distribution and trends of changes in blood components, including white blood cells (WBCs), red blood cells (RBCs) and platelets as well as received cumulative doses from occupational radiation exposure. This study was conducted among 199 participants and 100 control subjects at the medical imaging departments at the central hospital of Shiraz University of Medical Sciences during the years 2006–2010. Descriptive and analytical statistics, considering the P-value<0.05 as statistically significance was used for data analysis. The results of this study show that there is no significant difference between the radiation workers and controls regarding WBCs and platelet count during 4 years. Also, we have found no statistically significant difference between the two groups with respect to RBCs. Besides, no statistically significant difference was observed with respect to RBCs with regards to gender, which has been analyzed separately because of the lower reference range for normal RBCs levels in women compared to men and. Moreover, the findings confirm that in a separate evaluation between WBCs count and the personnel's working experience and their annual exposure dose, results showed no linear correlation between the three variables. Since the hematological findings were within the range of control levels, it can be concluded that the radiation dosage (which was not more than 7.58 mSv in this study) had been too small to stimulate any quantifiable change in medical radiation worker's blood count. Thus, use of more accurate method for screening program based on the working profile of the radiation workers and their accumulated dose is suggested. In addition, complexity of radiation-induced functions and the influence of various factors on blood count alteration should be taken into account.

Keywords : blood cell count, mandatory testing, occupational exposure, radiation
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