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DNA Fragmentation as a bio-indicator for long term effect of radiation on workers of radiation department of hospitals in Faisalabad

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The study was carried out at hospitals of Faisalabad especially (District Head Quarter Hospital (DHQ), Punjab Institute of Nuclear Medicine (PINUM), Allied Hospital and other private hospitals. The 100 subjects were selected and divided into 2 groups, 1st group of control (no exposure) and 2nd group which were indirectly exposed to radiation. A questionnaire was developed and the subjects who have at least 4-15 years of indirect exposure and belong to 20-50 years of age were selected. DNA fragmentation was examined. The % DNA fragmentation was calculated. The mean age of workers of different hospitals was non-significantly different ($p>0.05$). The minimum number of workers belongs to 24-28 years of age group, whereas maximum number belongs to 34-38 years. The minimum number of control was observed in 44-48 years of age group, and maximum number in 39-43 years of age groups. The workers of age group of 39-43 and 44-48 years were absent in FIC whereas DHQ and private hospitals lack workers in 24-28 years age group. The minimum exposure duration was 4 years in DHQ, FIC and private hospitals whereas it was 5 years in Allied hospital workers. In DHQ, Allied, FIC and private hospitals the maximum exposure duration were 15, 14, 11 and 15 years, respectively. The exposure duration of workers belonging to different hospitals was non-significantly different ($P>0.05$). In DHQ the minimum age was 29 years and maximum age was 46 years with mean % DNA fragmentation±S.E (58.98±1.35). In Allied hospital the minimum age was 28 years and maximum age was 45 years with mean % DNA fragmentation±S.E (57.29±1.17). In FIC the minimum age was 24 years and maximum age was 35 years with mean % DNA fragmentation±S.E (56.17 ±1.50). In private hospitals the minimum age was 29 years and maximum age was 46 years with mean % DNA fragmentation±S.E (58.43±0.82). The different age groups showed highly significant effect of % DNA fragmentation ($P<0.01$). The % DNA fragmentation showed positive and highly significant ($p<0.01$) correlation with age and exposure duration. The % DNA fragmentation at different hospitals was non-significantly different ($P>0.05$). The long-term exposure of ionization radiation causes induction of DNA damage. The % DNA damage increases with increasing age and exposure duration in radiationally exposed workers. The present study showed % DNA fragmentation could be use as a biomarker for the estimation of radiological effects in occupationally exposed workers.

Recent Publications

1. Anderson P Aguilera, D Pearson M and Woo S (2008) Outpatient Chemotherapy plus radiotherapy in sarcomas: improving cancer control with radio sensitizing agents. Cancer Control. 15(1):38-46.
2. Cardoso R, Takahashi Hyodo S, Peitl P, Ghilardi Neto T and Sakamoto Hojo E (2010) Evaluation of chromosomal aberrations, micronuclei, and sister chromatid exchanges in hospital workers chronically exposed to ionizing radiation. Teratogenesis, Carcinogenesis, and Mutagenesis. 21(6):431–439.
3. Czene S, Meijer A E, Saeidi A B, Zelenskaya A, Granath F and Harms Ringdahl M (2010) influence of dose-rate post-irradiation incubation time and growth factors on interphase cell death by apoptosis and clonogenic survival of human peripheral lymphocytes. Int. J. Radiat. Biol. 75(10):1265-1273.

Biography

Salma Sultana, working as Associate professor, Department of Zoology, GC University,Pakistan, is HEC approved PhD Supervisor. I have completed my Post Doctorate Funded by HEC from Newcastle University, UK, Ph.D (Biology) ; M.Phil (Genetics) from Quaid-i- Azam University, Islamabad. I have research expertise in the field of bimolecular techniques, Genetics, Fisheries; Epidemiology of Genetic Diseases toxicology (aquatic and occupational). I have more than 20 years teaching experience and more than 12 year post doctoral teaching and research experience as Lecturer, Assistant Professor and Associate Professor. I have been awarded by three projects as BC-HEC (JHELP-II) project as Link; Co-link Coordinator (2006-2009), Co-PI In HEC funded project and BC-HEC (INSPIRE-II) project entitled as team member and as CO-PI in NRPU funded by HEC, Pakistan. Presently I am working as Director Academics of GCUF and Manager external linkage in ORIC-GCUF. I have worked in the capacity of Deputy Director Student affairs; Research (Sciences), Focal Person for Anti-plagiarism, Member of fee rationalization, migration, equalence and university vigilance committees, Warden of university hostels and different duties at departmental level. I am life time member of Pakistan Proteomic Society; Zoological Society of Pakistan; member Pakistan Society of Aquaculture and Fisheries. I have also published 63 peer reviewed papers.

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