



Evaluation of Global DNA Methylation Levels in Medical Workers Exposed to Low-Dose of Ionizing Radiation

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Abstract: Occupational exposure to low dose ionizing radiation (LDIR) has the potential to adversely affect genomic integrity. The normal epigenetic marks, including DNA methylation, have a key role in maintaining genomic stability. Accordingly, this study was conducted to investigate the potential influence of occupational exposure to LDIR on the global DNA methylation levels in a set of blood samples collected from medical imaging workers. Blood samples were collected from 40 subjects (mean of age 47.07 years ranging from 25 to 60 years) occupationally-exposed to LDIR and 20 age-matched radiation-not-exposed individuals. Global DNA methylation (5mC %) levels were estimated using MethylFlash™-Methylated DNA Quantification Kit. The occupational exposure to LDIR resulted in significant increase in the level of global DNA methylation in medical imaging workers when compared to radiation-not-exposed controls (0.502 vs. 0.221, P= 0.0181) and this change in the level of 5mC% was directly affected by the exposure period. Overall, study showed that medical imaging workers who are occupationally-exposed to LDIR have increased levels of global DNA methylation and this increase could be due to increase in the expression of epigenetic modifiers genes in the LDIR occupationally-exposed subjects.

Keywords: LDIR, Occupational exposure, Global DNA methylation, Medical workers
