Assessment of Background Frequency of Micronuclei Formation in Two Selected Populations in Sri Lanka

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This study assessed background frequency of micronuclei formation using biodosimetry in persons living in Norochcholai and Ragama in Sri Lanka. Biodosimetry, a technique used to assess exposure to radiation, is considered superior to physical dosimetry. It gives a clearer picture of individual variation of susceptibility to radiation and human risk assessment. This study establishes baseline levels of micronuclei formation in a Sri Lankan population to monitor possible radiation accidents that may occur at a nuclear power plant that was commissioned in nearby India recently. Biodosimetry has been used to detect external and internal exposure to ionising radiations in scenarios of accidental and occupational exposure wherever nuclear power plants are present. 96 healthy individuals from both sexes were selected for the study (in the age range of 20-59 years), comprising 50 from Norochcholai (area closest to the power plant) and 46 (matched for gender, age and life style) from Ragama (as a control). 10ml of venous blood was drawn and the cytokinesis–block micronuclei assay was performed, 1000 binucleate cells were assessed; the median spontaneous micronuclei formation was estimated. Background radiation was measured using an Automess dose rate meter 6150AD. There was no significant difference in the median MN frequency between the two sexes (p= 0.538). There was no significant difference between the median background frequency of micronuclei formation between the two study areas (p=0.539). Significantly higher radiation dose rate (measured by suevey meter) has been shown in Ragama area compared to Norochcholei area (Mann Whitney U= 217.00, p=0.000). There was no strong correlation between background radiation and MN frequency in both areas. The MN frequency can be used as a baseline to monitor exposure to radiation in the future. This is important for monitoring radiation hazards and will be useful in case of a nuclear accident.

Keywords: micronuclei, Biodosimetry, Nuclear power plant, background radiation, dose rate

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