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Biological Dosimetry Following X-ray Irradiation

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**Abstract:** Control radiation dose-response curves are necessary in evaluating the absorbed radiation dose of similar radiation quality following radiation accidents or in monitoring the health of both the public and radiation workers. Each biological dosimetry laboratory should establish its own control dose-response data. In this study our aim was to establish control curves for 200 kVp X-rays in our laboratory in order to estimate absorbed radiation doses following exposures. Blood samples from healthy individuals with no radiation working history were irradiated in heparinized tubes at 10 different doses 0.10-5.00 Gy. Cells from irradiated whole blood were incubated in culture containing phytohemagglutinin for lymphocyte propagation. Dividing cells were blocked at metaphase, fixed, stained, and unstable chromosome aberrations were scored. Yields of dicentrics and excess acentrics following different radiation doses were used to establish control curves. The data were fitted to the linear-quadratic (LQ) equation. The parameters of the LQ equations were used in the Q dr method to estimate an absorbed radiation dose in five people working with medical X-ray radiation for a relatively long time. Estimations showed that four workers received doses below the permissible levels but one showed an indication of overexposure.

**Key Words:** Biological dosimetry, X-ray, chromosome aberrations.

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