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# Risk assessment of eye lens dosimetry for nuclear medicine worker.

The International Atomic Energy Agency: IAEA has reviewed on the dose limit for the lens of the eye followed the recommendation of the International Commission on Radiological Protection: ICRP in its statement in April 2011. The dose limit to the eye was reduced from 150 mSv in a year to 20 mSv in a year, averaged over defined periods of 5 years, with no annual dose in a single year exceeding 50 mSv. IAEA still announced a measurement value of personal dose equivalent at 3 mm depth with a dosimeter worn as close as possible to the eye and calibrated on a head shape phantom in IAEA Technical Document No. 1731(2013) : Implications for Occupational Radiation Protection of the New Dose Limit for the Lens of the Eye. The new dose limit and the measurement closed to the eye had made an impact to workers who received dose more than 20 mSv per year and worn dosimeter at whole body which not represented to real dose. The Office of Atoms for Peace announced in the Royal Gazette (2018) with the reduction of the dose limits and recommended to Personal Radiation Monitoring Service laboratory for development of the lens of eye dose calibrated at eye adjacent including with to investigate the risk assessment of the effects of radiation on eye lens upon the new dose limit for medical worker.

The purpose of this research is to develop the lens of eye dose for nuclear medicine (NM) workers due to related with gamma and beta from radioisotope and a longtime exposure. The risk assessment of radiation lens injury was performed from the relationship of averaged eye lens dose to affect the prevalence of radiation-associated posterior lens opacities or cataract. In this research, calibration technique for a small OSL dosimeter was developed to be eye lens dosimeters which inserted at 3 mm depth of head shape phantom. The calibrated dosimeters were worn from NM workers at eye adjacent for finding averaged accumulative dose in a year. 31 NM workers who received the highest eye doses were chosen to eyes examination by experienced ophthalmologists using slit-lamp. Posterior subcapsular cataract (PSC) was graded according to a modified Merriam-Focht scoring system and a grading score of 1 and above in either eye was considered as early cataract by radiation effect. The conclusions of this research shown the NM workers who received high dose might be found the opportunity of cataract when getting older from the results of PSC grades above 1.0 score. From 31 NM workers were found the prevalence of radiation-associated posterior lens opacities in the right and left eye lens was 10 (13.16 %) and was 11(10.26 %) respectively.

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