Reanalysis of the nuclear worker cohort J-EPISODE with follow-up period 1991-2010 using organ-absorbed dose

放射線業務従事者コホートJ-EPISODE （追跡期間1991-2010）の臓器吸収線量を用いた再解析

○Hiroshige Furuta, Akemi Nishide, Shin'ichi Kudo, Noboru Ishizawa, Shin Saigusa

Radiation Effects Association

○古田 裕繁、西出 朱美、工藤 伸一、石沢 昇、三枝 新

（公財）放射線影響協会

Background and aim : Japanese Epidemiological Study on Low-Dose Radiation Effects（ J-EPISODE） has analyzed health effects in association with photon exposure assessed in H_p（10） since 1990. However, it is under way to estimate cancer morbidity and mortality risk for a new cohort set up in 2019 in terms of organ-absorbed dose. The study aims to reanalyze cancer mortality risk for J-EPISODE fifth analysis with follow-up period 1991-2010 using organ-absorbed dose.

Materials and methods : The reconstruction method of organ-absorbed dose principally followed the approach adopted in the IARC 15-Country Collaborative Study. However, the method in the study was modified considering actual usage practice of dosimeters in Japan and body size of Japanese. Conversion coefficient from dosimeter reading to organ-absorbed dose was computed using dosimeter response defined as reading per air kerma, and coefficient from air kerma to organ-absorbed dose ; which was followed by reconstruction of organ-absorbed dose for subjects of J-EPISODE during 1957 to 2010. Then, Poisson regression method was applied for estimating Excess Relative Risk per Gray（ ERR/Gy） for all and specific cancer mortality, in the same way as the fifth analysis of J-EPISODE, both for all 204.103 subjects and for a part of 71,733 subjects with life-style information.

Results : Conversion coefficient from reading to organ-absorbed dose was approximately 0.8 Gy/Sv. The estimated ERRs/ Gy for all and specific cancer mortality in terms of organ- absorbed dose were consistent with the fifth analysis, revealing that risk estimation using organ-absorbed dose became applicable for J-EPISODE.
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