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Links

[Cancer mortality in high background radiation area of Yangjiang, China, 1979-1995]

[Article in Chinese]

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OBJECTIVE: To estimate cancer risk associated with the low level radiation exposure of average annual effective dose of 6.4 mSv in HBRA the high background radiation area (HBRA) of Yangjiang, China. METHODS: The cancer mortality data of 1979-1986 were collected from a dynamic cohort by prospective survey. The data of 1987-1995 were obtained from a fixed cohort by retrospective and/or prospective survey. The mortality investigation on the spot consisted of two steps, i.e. the follow-up of the members in the cohort and the ascertainment of the death causes. The estimate of cumulative individual dose of the cohort members included that of the exposure from natural external and internal sources. Both direct (TLD measurement) and indirect (environmental measurement and occupancy pattern) approaches were used for individual external dose estimate. On the basis of the hamlet-specific average annual external dose, the cohort members were classified into four groups for internal comparison: high, medial and low dose groups from HBRA and control group from control area (CA). Relative risk (RR) and excess relative risk coefficient (ERR per sievert) and its 95% confidence interval (CI) was estimated using AMFIT program in Epicure. RESULTS: During the period 1979-1995, there were 10,415 total deaths and 1003 cancer deaths among 1,698,350 person-years at risk in the cohort of 125,079 subjects. The adjusted RR (95% CI) with sex and age group for all cancers of whole HBRA was 0.99 (0.87-1.14). As for the site-specific cancer of whole HBRA, the RRs of cancers of stomach, colon, liver, lungs, bone, female breast, and thyroid were less than one, while the RRs of cancers of nasopharynx, esophagus, rectum, pancreas, skin, cervix uterus, brain and central nervous system, leukemia and lymphoma were larger than one. However, all of them except for esophagus cancer were not different statistically from one ($P > 0.05$). The homogeneity tests of RRs for all cancers and for site-specific cancer among the three dose groups in HBRA revealed that the RRs in these dose groups were not different statistically ($P > 0.05$) for all. The ERR (95% CI)/Sv of all cancers for both sexes and all ages was -0.10 (-0.67, 0.69). CONCLUSION: An increased cancer risk associated with the high levels of natural radiation in HBRA was not found. On the contrary, the mortality of all cancers in HBRA was generally lower than that in CA, but not significant statistically.

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