

Thyroid and Breast cancers following radiotherapy for a hemangioma during infancy

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ABSTRACT

Background and purpose A cohort study was performed to investigate the carcinogenic effect of treatment with ionizing radiation of skin hemangioma in early childhood. This study presents the incidence of differentiated thyroid and breast cancers after radiotherapy in this cohort. **Methods and Materials** Of a total of 8307 patients treated for a skin hemangioma between 1940 and 1973 at the Institut Gustave-Roussy, 4 767 (3 317 women) were included in an incidence study, among whom 3 795 (2 698 women) received radiotherapy. External radiotherapy, Radium 226, Strontium 90, Yttrium 90, and Phosphorus 32 were used as treatment. The mean age at first exposure was 0.7 years and the mean absorbed dose to the breast was 70 mGy and 41 mGy to the thyroid. Breast and Thyroid tumors cases were obtained by sending a questionnaire, and verified from pathological reports. Estimation of breast and thyroid cancer specific incidence rates in French population was obtained from French cancer registry network. External and internal analyses were performed. **Results** During an average follow-up of 35 years, a total of 11 patients developed a differentiated thyroid carcinoma and 19 women developed BC, i.e. respectively 2.5 (95%CI: 1.4-4.4) and 2.5 (95% CI 1.5-3.8) more than expected from French general population. An association between weight and BMI at age 18 and BC risk was observed. Thyroid carcinoma incidence was higher in non-smoker patients. As compared with patients who had not received radiotherapy, those who had, had a 3.5 times higher (9%CI : 2.2-5.4) risk of developing a BC. Despite the risk of BC was multiplied by 3.6, 6.0, 7.9, for dose of radiation to breast varying, respectively from, 0 to 10, from 10 to 100, and > 100 (mGy), as compared to patients who did not received radiotherapy, the dose response was not significant. However, a significant dose response relationship was estimated between the radiation dose received to thyroid and the risk of thyroid cancer (Excess Relative Risk per GY, ERR/Gy: 14.7, 95%CI: 1.6 - 62.9). **Conclusion** This study confirms that radiation treatment performed in the past for hemangioma during infancy increased the risk of thyroid and breast cancers.