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Thyroid hormones and cancer: Clinical studies of hypothyroidism in oncology

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Much experimental, clinical and epidemiological effort has been directed at defining and clarifying the putative and controversial relationship between the thyroid gland and cancer. This unique association found support in preclinical studies that revealed that thyroid hormone supplementation increased tumor growth rates, whereas thyroid hormone deprivation removed this stimulus. Recently, growing body of epidemiological and clinical evidence suggests improved survival in individuals with primary/secondary hypothyroidism in a variety of tumor types. Moreover, the pharmacological induction of mild biochemical hypothyroidism, significantly improved survival in patients with glioblastoma multiforme (GBM), one of the deadliest refractory forms of brain tumors. Finally, enhanced response rates to chemo/radiation therapy in hypothyroidism have also been reported in preclinical/clinical studies. For years the biological explanation for the link between thyroid hormones and cancer was not recognized and was attributed to "classical" thyroid functions, mainly metabolism rate. The possible association between thyroid hormone and cancer may now be better understood following the discovery of a binding site for T3 and T4 on a plasma membrane receptor, integrin αv3β. This receptor, which is over expressed by all tumor vascular cells and an array of cancer types, appears to mediate the proliferative action of the hormones. This recently understood molecular mechanism may shed light on the numerous and controversial clinical studies of thyroid hormone and cancer. Taken together, a possible protective effect of sub clinical hypothyroidism in cancer is suggested and may re-initiate interest in blocking thyroid hormones action as a novel therapeutic approach in cancer.

Biography

Osnat Ashur-Fabian received her MSc (with distinction) and her PhD from the Sackler Faculty of Medicine, Tel-Aviv University, Israel. Following 3 years of Post doctorate training at the Sheba Cancer Research Center, Israel, she established a translational research laboratory at the Sapir Medical Center, affiliated to the Department of Human Molecular Genetics and Biochemistry, Sackler Faculty of Medicine, Tel Aviv University, Israel. She has published 27 papers in reputed journals (including PNAS, Oncogene and Leukemia).

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