

Insulin Resistance and Thyroid Cancer

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ABSTRACT

It is known that the cancer development process is multifactorial nowadays. The relationship between insulin and cancer has recently been gaining in importance. The number of studies between insulin resistance and thyroid cancer is very small, although the association between obesity, type 2 diabetes, and insulin resistance, particularly breast, colon, and pancreatic cancer development, is long. There are studies advocating increased growth factors with insulin resistance as well as triode cancer after thyroid angiogenesis. Insulin and insulin-like growth factors may be the primary causes of pathophysiology in many cancers, especially thyroid cancer, with mitogenic activity.

Key words: Insulin resistance, obesity, cancer

Obesity, which doubles in the last three decades, is the most common metabolic problem associated with insulin resistance.^[1] Cancer-related deaths that are 14% in men and 20% in women are linked to obesity. Insulin resistance has been shown in studies in which the proliferation of thyroid cells is stimulated to cause growth in the thyroid gland and thyroid nodules. When the relationship between insulin resistance and thyroid cancer is examined, there are four basic studies in the literature [Table 1]. Three of these studies showed a positive relationship between insulin resistance and thyroid cancer, but no relationship was found in one study.

Two adipokines that play a role in the cancer pathophysiology potentially associated with the best-known insulin resistance are leptin and adiponectin.^[6] Leptin functions mainly as an appetite regulator through specific membrane receptors. Leptin abnormal expression is associated with thyroid cancer and various malignant diseases.^[7,8] Adiponectin is an adipocyte that is negatively associated with insulin resistance.^[6] There are a number of studies showing a strong association between serum thyroid-stimulated hormone (TSH) levels and thyroid cancer development in thyroid cancer formation. The mitogenic effect of TSH on human thyroids is thought to be enhanced by insulin and insulin-like growth factors.^[9,10]

Table 1: Insulin resistance and thyroid cancer^[2-5]

Authors	Country	DTC*/control	DTC GROUP -HOMA-IR	Control GROUP -HOMA-IR	P
Sahin <i>et al.</i>	Turkey	344/116	3.6±1.1	2.12±0.9	P<0.0001
Rezzónico <i>et al.</i>	Argentina	20/20	%50>2.5	%10>2.5	P<0.001
Balkan <i>et al.</i>	Turkey	41/41	2.5±2.2	1.8±1.1	P>0.05
Bae <i>et al.</i>	Korea	735/537	1.32 (0.80–1.54)	0.98 (0.59–1.09)	P<0.001

*DTC: Differentiated thyroid carcinoma

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In animal studies, it has been argued that chronic hyperinsulinemia plays an important role in the development of cancer in male mice overexpressing insulin-like growth factor 1 receptors.^[11,12] In a recent study, he suggested that insulin resistance may increase the growth of thyroid nodules by increasing angiogenesis.^[13] In this case, it is possible to predict the proliferation of cells by stimulating vascular endothelial growth factor expression of the basic pathophysiologically responsible insulin.^[14]

There is a need for further studies in the world whether increased thyroid cancer is associated with increased obesity and insulin resistance.

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