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Association of Body Mass Index and Thyroid Stimulating Hormone Levels with Thyroid Cancer Among Genders in MU-TNED (MU-Thyroid Nodule Electronic)

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Introduction: Thyroid cancer is increasing in the US, making it the sixth most common cancer especially in women according to SEER data. The National Cancer Institute has identified thirteen cancers associated with obesity, including thyroid cancer. Higher BMI has been associated with a slight (10%) increase in the risk of thyroid cancer. Thyroid stimulating hormone (TSH) is a hormone produced by the pituitary gland to regulate thyroid function. This study focuses on investigating the association between TSH, BMI, and the risk of thyroid cancer among males and females in the MU-Thyroid Nodule Electronic Database (MU-TNED), that includes patients with nodular thyroid disease.

Methods: A retrospective chart review of MU-TNED and the electronic medical record system used by the University of Missouri Healthcare, called Powerchart, was used to evaluate the extracted patient history of patients from 2014-2019. Patients were divided into groups of higher BMI (≥ 30) and lower BMI (< 30), patients with malignant disease (thyroid cancer) and patients with no malignancy. Descriptive statistics were used to assess the data. A logistic regression was used adjusting for BMI and TSH assessing the association of thyroid cancer with BMI, TSH, and gender.

Results: A total of 3,000 patients were evaluated from MU-TNED. BMI and TSH showed a p-value that was statistically significant ($p < 0.05$). Results of our data show that BMI and TSH are related to a slightly higher risk of thyroid cancer. There is also a higher risk of developing Thyroid cancer when TSH levels are ≥ 4 and BMI is ≥ 30 in patients with nodular disease.

Conclusion: We confirmed that BMI and TSH are statistically significant in regard to developing Thyroid cancer. High BMI and TSH levels are associated with a higher risk of developing Thyroid cancer. Among genders, male and female, females have a higher risk of developing Thyroid cancer.

1. "CDC Press Releases." CDC, 1 Jan. 2016, <https://www.cdc.gov/media/releases/2017/p1003-vs-cancer-obesity.html>.
2. Enewold, Lindsey, et al. "Rising Thyroid Cancer Incidence in the United States by Demographic and Tumor Characteristics, 1980–2005." *Cancer Epidemiology, Biomarkers & Prevention* : A Publication of the American Association for Cancer Research, Cosponsored by the American Society of Preventive Oncology, vol. 18, no. 3, Mar. 2009, pp. 784–91, doi:10.1158/1055-9965.EPI-08-0960.
3. Han, Ji Min, et al. "Obesity Is a Risk Factor for Thyroid Cancer in a Large, Ultrasonographically Screened Population." *European Journal of Endocrinology*, vol. 168, no. 6, June 2013, pp. 879–86, doi:10.1530/EJE-13-0065.
4. TSH Levels: What Do Normal, High, and Low Levels Mean? 24 Oct. 2019, <https://www.medicalnewstoday.com/articles/326774>.