



SURGICAL THYROID GLAND DISEASES: EPIDEMIOLOGY AND NECK RADIATION EFFECT

Mhd Nezar Alsharif¹ and Khaled Alhomsy^{2*}

¹Department of Internal Medicine, Faculty of Medicine, Damascus University, Damascus, Syria.

²Alsham Private University (ASPU), Damascus, Syria.

***Corresponding Author: Khaled Alhomsy**

Alsham Private University (ASPU), Damascus, Syria.

Email ID: k.a.foph.lat@aspu.edu.sy,

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ABSTRACT

Objective: This study aimed to study the epidemiological data of surgical thyroid diseases, the frequency of symptoms of these diseases. **Materials and Methods:** This study was a retrospective study of the files of 80 patients who reviewed different clinics in Damascus, Syria between 1 June 2019 and 31 January 2020 and were diagnosed with thyroid diseases. The variables recorded included age, gender, symptoms of the patients, history of previous radiation and the surgical treatment used. **Results:** In our study, we had female prevalence of 82.5%. The most common manifestations were lump in the neck (70 patients, 87.5%), followed by dysphagia (28 patients, 35%) and pain in the neck (25 patients, 31.3%). However, the least common manifestations were fever and diarrhea with (5 patients, 6.3%) for each. Most of the cases were treated by total thyroidectomy (74.3%), while 25.7% were treated by thyroid lobectomy. **Conclusion:** We had a dominant female prevalence. The most common manifestation was lump in the neck. Moreover, most of the cases were treated by total thyroidectomy. It is important to highlight the cases with previous neck radiation with the majority of them being diagnosed with papillary carcinoma of the thyroid. This study shows the need for a bigger study on a larger scale in order to understand the epidemiological data of surgical thyroid diseases.

KEYWORDS: Thyroid Diseases, Radiation Exposure, Gland.

INTRODUCTION

Thyroid diseases are common problem in the population. This small gland located in the neck plays an important role in regulating metabolism, as well as in functioning of a whole range of organs and organ systems. As there are various causes for these diseases, there are various causes for increased incidence, such as better diagnostics, radiation exposure (i.e. the Chernobyl accident as a cause of a greater number of malignant thyroid diseases in the exposed area). Incidence of thyroid diseases after radiation exposure in adults increases by 16-31%.^[1] The prevalence of thyroid disorders depends on a large number of factors, of which, the most important include: age, sex, geographic factors, ethnicity.

The prevalence of thyroid disorders is higher in countries with iodine deficiency, where endemic goiter is also present.^[2] Nearly one third of the world's population lives in areas with iodine deficiency.^[3]

In areas where daily iodine intake is <50µg, goiter is usually endemic, and when daily intake falls to <25µg, the congenital hypothyroidism is noticed. Goiter prevalence in the areas of serious iodine deficiency can

be as high as 80%. Populations at a special risk have tendency to be remote and live in mountainous areas in southeast Asia, Latin America and Central Africa. Iodization programs have shown the value in decreasing the number of goiter and preventing development of goiter and cretinism in children. It can independently develop into nodular goiter which can occasionally lead to thyrotoxicosis, and iodization programs can also cause thyrotoxicosis, especially in people older than 40 years with nodular goiter.^[4] In the areas of iodine sufficiency, most people with thyroid gland disorders have an autoimmune disease, ranging from primary hypothyroidism, Hashimoto thyroiditis and thyrotoxicosis caused by Graves' disease. Cross-sectional studies in Europe, USA and Japan have determined the prevalence of hyperthyroidism and hypothyroidism in various Caucasian communities (white race community).^[4] Data from a large US population screening^[5,6] revealed differences in frequency of thyroid gland dysfunction in various ethnic groups, while studies from Europe found the effect of nutritional iodine in epidemiology of thyroid gland dysfunction.^[7] Studies on frequency of autoimmune thyroid gland disease were carried out only in a small number of developed countries.^[8] According to

morphological criteria, thyroid diseases can be divided to tumor and non-tumor diseases. The pathology of thyroid nodules can be present at any age and is very common in clinical practice.

Causes for thyroid nodules are complex and still underexplored. One of the important factors in pathogenesis of nodular disease is thyroid-stimulating hormone (TSH), as a strong stimulator of thyroid growth. In a normal gland or in a diffuse goiter, thyroid nodules can be solitary or multiple. In a multinodular goiter, one nodule can be clinically dominant in growth, dimensions and functional characteristics. Nodules are divided into neoplastic, which include hyperplastic and inflammatory nodules (within acute bacterial, subcutaneous or Hashimoto's thyroiditis) and neoplastic which are divided to benign and malignant. Benign neoplastic nodules include adenomas and malignant include primary carcinomas (papillary, follicular, medullary and anaplastic), lymphomas and metastases in thyroid gland originating in another organ. According to the functional state, they are divided to euthyroid (normal function), hyperthyroid (overactive function), hypothyroid (underactive function). The findings are referred to as normal, high and low.

MATERIALS AND METHODS

This study was a retrospective study of the files of 80 patients who reviewed different clinics in Damascus, Syria between 1 June 2019 and 31 January 2020 and were diagnosed with thyroid diseases. The variables recorded included age, gender, symptoms of the patients, history of previous radiation and the surgical treatment used. To ensure the privacy, only the authors collected all the data. Furthermore, all the names and personal information were blinded. Statistical analysis was done using SPSS 25.0.

RESULTS

Most of the patients were females (82.5%) compared to males (17.5%). (Figure 1).

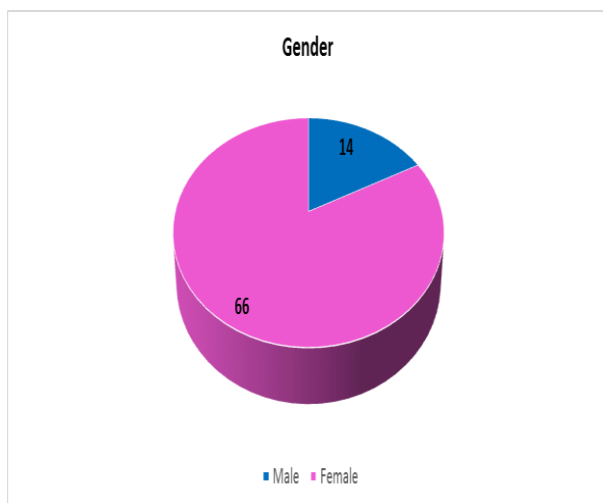


Figure 1: Gender of participants in our study.

Most of the cases were treated by total thyroidectomy (81.3%), while 18.7% were treated by thyroid lobectomy. (Figure 2).

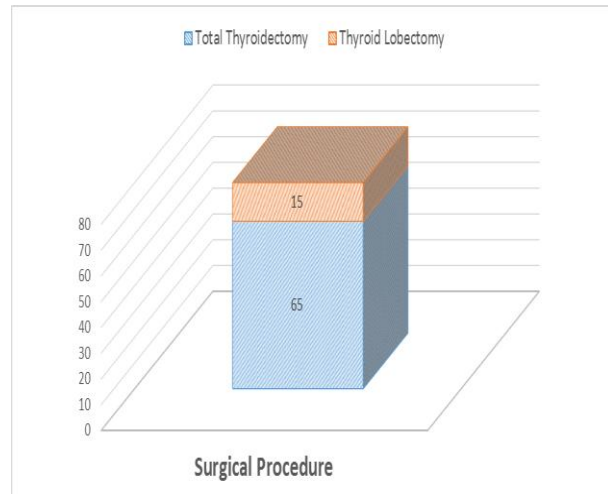


Figure 2: Surgical Procedure used on patients in our study.

The most common manifestations were lump in the neck (70 patients, 87.5%), followed by dysphagia (28 patients, 35%) and pain in the neck (25 patients, 31.3%). However, the least common manifestations were fever and diarrhea with (5 patients, 6.3%) for each. The remaining manifestations are shown in (Figure 3).

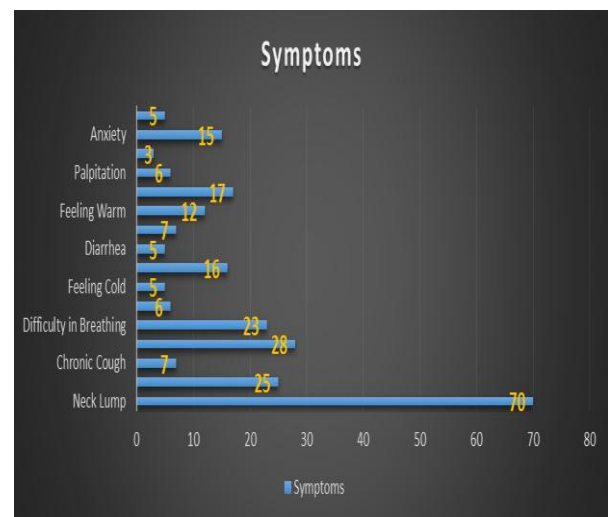


Figure 3: Distribution of symptoms among patients in our study.

Seven patients (8.8%) had a history of thyroid radiation and 6 of them (85.7% of patients with radiation history) had papillary carcinoma and one patient had goiter (14.3% of patients with radiation history). (Figure 4, Figure 4).

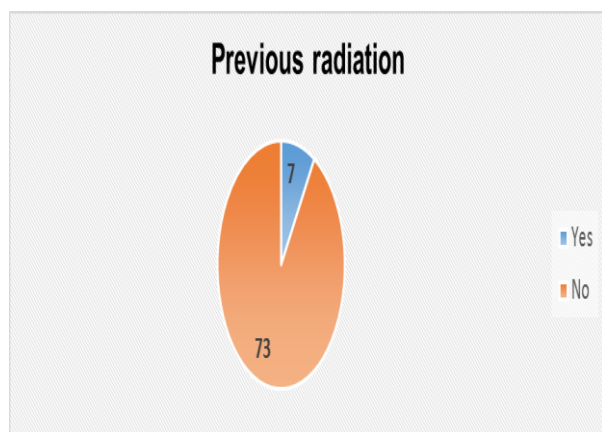


Figure 4: History of previous radiation of neck (Thyroid) in patients in our study.

We had a statistically significant correlation between the history of previous radiation and FNA diagnosis ($p < 0.05$)

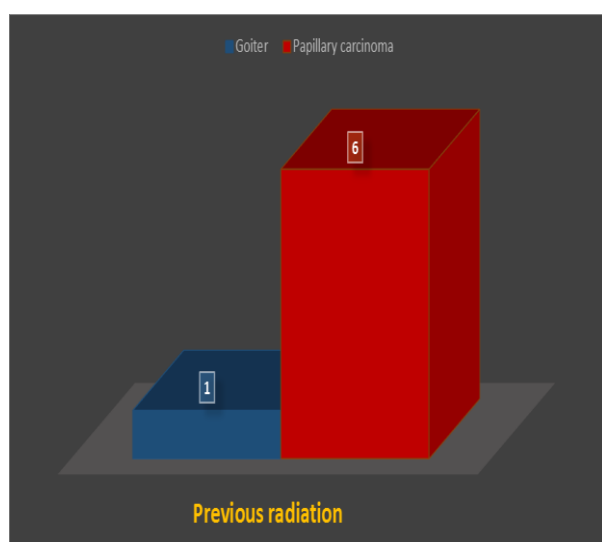


Figure 5: Correlation between previous radiation history and fine needle aspiration (FNA) diagnosis of thyroid lesions in patients of our study.

DISCUSSION

A similar study of surgical diseases of the thyroid gland showed a majority prevalence of females (82.2 %).^[15] In our study, it was similar with 82.5% female prevalence. (Figure 1).

Thyroid diseases have a wide range of manifestations such as neck pain, lump in the neck, chronic cough, dysphagia, difficult breathing, voice change, feeling cold or hot, Feeling tired and lethargic weight loss, bowel habits changes, depression and more.^[16]

In our study, the most common manifestations were lump in the neck (70 patients, 87.5%), followed by dysphagia (28 patients, 35%) and pain in the neck (25 patients, 31.3%). However, the least common manifestations were fever and diarrhea with (5 patients,

6.3%) for each. The previous and the remaining manifestations are shown in (Figure 3).

Thyroid gland is considered resistant to acute effects of radiation.^[17] However, it was proven that the thyroid is sensitive to long term effects of radiation.^[18] Different radiation-induced abnormalities include hypothyroidism, thyroiditis, Graves' disease, goiter and carcinomas. High amounts of radiation exposure increase the risk of thyroid carcinoma.^[19] In our study, seven patients (8.8%) had a history of thyroid radiation and six of them (85.7% of patients with radiation history) had papillary carcinoma and one patient had a goiter (14.3% of patients with radiation history). (Figure 4, Figure 5).

CONCLUSION

We had a dominant female prevalence. The most common manifestations were lump in the neck followed by dysphagia and pain in the neck. However, least common manifestations were fever and diarrhea. Furthermore, most of the cases were treated by total thyroidectomy. It should be noted the majority of cases with history of neck radiation had papillary carcinoma of the thyroid. This study shows the need for a bigger study on a larger scale in order to understand the epidemiological data of surgical thyroid diseases.

Compliance with Ethical Standards:

Funding: This study was not funded by any institution.

Ethical approval: The names and personal details of the participants were blinded to ensure privacy.

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