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Histopathology of Thyroid Diseases in Iraqi Patients

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Abstract: The aim of this investigation was for detection of thyroid diseases in Iraqi patients by using Histopathology. The present investigation involved a comprehensive examination of thyroid specimens that were received by the specialised Pathology laboratory in Baghdad, Iraq, during a duration of three years, from 2020 to 2023, 122 specimens were taken from both sexes and different ages. During the study period, all instances of thyroid diseases were obtained from the departmental records, which included bench books as well as histology reports. The physicians' completed patient request forms were collected for the purpose of obtaining biographical data. All histological specimens that were stained using the standard H & E technique were collected and analysed. New sections were generated from tissue blocks that had been fixed in formalin and embedded in paraffin, and were previously stored, in cases where there were missing or damaged slides. Subsequently, a microscopic examination and review were conducted. The current results showed that females (84.4%) were highly infected than males (15.6%) and the highly disease incidence was goiter (68%) when compared with other thyroid diseases. The presented results exhibited a highly percentages of diseases were recorded at age group middle age group (21-50 years) when compared with other groups. The study identified a total of 11 autoimmune/inflammatory disorders, comprising 7 instances of the Graves' disease, 3 instances of Hashimoto thyroiditis, and 1 instance of lymphocytic thyroiditis. The age range with the highest incidence is between 31 and 40 years, and this phenomenon is observed solely in the female population. The present study revealed that Graves' and Hashimoto thyroiditis exhibited varying degrees of lymphocytic infiltrates and lymphoid follicles. The principal dissimilarity observed was in the follicular organisation and cytomorphology of the epithelial cells. The trabecular adenoma contained both intracellular and extracellular hyaline materials. Colloid goiter depicts thyroid follicles of diverse sizes that contain colloid.
In conclusion, the prevalence of thyroid diseases in Iraq exhibited a higher incidence among females during the 4th and 5th decades of life. Colloid goiter, adenoma, and papillary carcinoma were identified by hsitopathology as the prevailing diseases.

Key words: Histopathology, Thyroid, Goiter, age, sex.

Introduction:

Diseases of the thyroid gland, an endocrine ailment, are common worldwide. The thyroid gland is a tiny, butterfly-shaped endocrine gland that weighs only around 20-25 grammes (1). Its job is to release hormones into the bloodstream. The thyroid gland, which controls metabolism, is near the base of the neck, just below the throat (2). Thyroxine (T4) and triiodothyronine (T3) hormones, respectively, are synthesised and secreted by the thyroid follicles at a rate of around 93% and 7%, respectively. This is supported by other sources (3, 4).

TSH, or thyroid stimulating hormone, is produced by the pituitary gland in the brain and plays a crucial role in activating the thyroid gland to produce and release T3 and T4 hormones into the circulation. The scientific literature supports these claims (2, 5).

Disturbances in the production and control of thyroid hormone are connected to a wide range of symptoms, from a mild goitre to potentially fatal diseases (3,6).

Hormones have a crucial role in controlling a wide range of bodily functions, including metabolism, growth, muscular strength, menstrual cycles, and organ function (7). In general, they hold significant importance in the existence of human beings, primarily for the growth and maintenance of nearly all human tissues, as well as the control of metabolic processes (8,9).

Thyroid disorders primarily arise from iodine deficiency. The primary characteristics observed in these disorders are thyroid dysfunction and thyroid gland enlargement (10).

The aforementioned anomalies primarily manifested as lesions that exhibited an inflammatory aetiology, as well as congenital malformations, endocrine-related irregularities, and both benign and malignant neoplasms (11). The symptoms of an underactive thyroid are consistent across both genders and include fatigue, weight gain, depression, weakness, and elevated cholesterol levels (12).

Hyperthyroidism and hypothyroidism are significant thyroid hormone disorders characterised by excessive and insufficient secretion, respectively. These circumstances give rise to thyroid abnormalities that exhibit various indices and indications (13).

Thyroid abnormalities have been documented globally across more than 110 countries, placing approximately 1.6 billion individuals at risk due to their residence in regions with insufficient iodine levels. The aforementioned regions primarily consist of developing nations, namely Asia, Africa, and Latin America (14).

Prior research has indicated that the global incidence of thyroid disorders is 25% among females and 0.6% among males (15-17). The prevailing types of thyroid cancer are papillary carcinoma and multinodular goitre. The incidence of thyroid abnormalities is influenced by various risk factors, such as age, gender, ethnicity, geographic location, iodine consumption, and exposure to radiation (18-20).

Histological examination is capable of detecting thyroid diseases, whereas cytological evaluation is not as effective in this regard. This has been established by previous research (21).

The aim of this investigation was for detection of thyroid diseases in Iraqi patients by using Histopathology.

Methodology:

The present investigation involved a comprehensive examination of thyroid specimens that were received by the specialised Pathology laboratory in Baghdad, Iraq, during a duration of three years, from 2020 to 2023, 122 specimens were taken from both sexes and different ages. The records, including bench books and histology reports, were combed for all cases of thyroid disorders that occurred during the research period. The physicians' completed patient request forms were collected for the purpose of obtaining biographical data. All histological specimens that were stained using the standard H&E technique were collected and analysed. New sections were generated from tissue blocks that had been fixed in formalin and embedded in paraffin, and were previously stored, in cases where there were missing or damaged slides. Subsequently, a microscopic examination and review were conducted.

Results and discussions:

The current results showed that females (84.4%) were highly infected than males (15.6%) and the highly disease incidence was goiter (68%) when compared with other thyroid diseases (Table 1).

Table 1. thyroid diseases distribution according to the sex

	Histological types	

Gender	Congenital	Autoimmune	Goiter	Neoplastic		Total (%)
				Benign	Malignant	
Male	4	2	10	2	1	19 (15.6%)
Female	6	9	73	12	3	103 (84.4%)
Total	10 (8.2%)	11 (9%)	83 (68%)	14 (11.5%)	4 (3.3%)	122

The presented results exhibited a highly percentages of diseases were recorded at age group middle age group (21-50 years) when compared with other groups (Table 2).

Table 2. thyroid diseases distribution according to the age

Age (y)	Histological types					Total (%)
	Congenital	Autoimmune	Goiter	Neoplastic		
				Benign	Malignant	
10-20	8	1	6	1	0	16 (13.1)
21-30	2	2	18	1	0	23 (18.9)
31-40	0	3	26	4	1	34 (27.9)
41-50	0	4	28	6	2	40 (32.8)
Above 51	0	1	5	2	1	9 (7.3)
Total	10 (8.2%)	11 (9%)	83 (68%)	14 (11.5%)	4 (3.3%)	122

Previous research has demonstrated that thyroid defects are correlated with age and sex. According to the survey conducted on global diseases, thyroid disorders exhibited the highest prevalence, with 25% in females and 0.6% in males (22). Several studies have demonstrated that the incidence of thyroid disorders is more prevalent among females than males during middle age (23-24).

The aforementioned data aligns with our own findings, which indicate a higher incidence of thyroid defects among female patients compared to male patients, with a ratio of 19.3:3. The high prevalence of gender disparity in females may be attributed to the influence of oestrogen and progesterone. The results of the Iraqi study showed that females accounted for 1.6 times as many cases of hypothyroidism as males did (25).

Thyroid cancer incidence was 90% in females and 89.7% in males in Yemen (26), with a little difference between the sexes. Thyroid issues appear more often as people become older, and this is true for both sexes. Patients' ages ranged from 49 to 78, with the median age being 49 and the maximum age being 60 for men and 78 for females, respectively. According to the research, thyroid cancer is more common in the elderly and might cause serious complications if not treated early (27).

The study identified a total of 11 autoimmune/inflammatory disorders, 3 instances of Hashimoto thyroiditis, comprising 7 instances of Graves' disease, as well as 1 instance of lymphocytic thyroiditis. The age range with the highest incidence is between 31 and 40 years, and this phenomenon is observed solely in the female population. The present study revealed that Graves' and Hashimoto thyroiditis exhibited varying degrees of lymphocytic infiltrates and lymphoid follicles, as depicted in (Figure 1). The principal dissimilarity observed was in the follicular organisation and cytomorphology of the epithelial cells. Follicles in Hashimoto thyroiditis were smaller and coated with cuboidal cells, whereas follicles in Graves' disease were larger and lined with columnar cells.

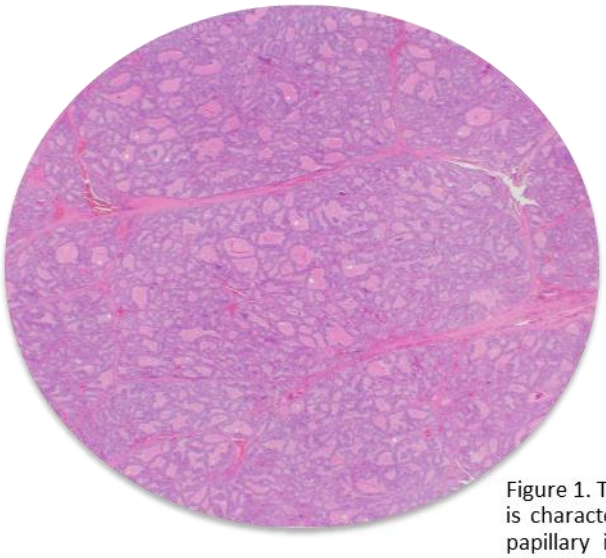

Figure 1. The observed pathology in Graves' disease is characterised by hyperplastic follicles exhibiting papillary infoldings, as well as the presence of lymphoid aggregates in certain areas (H &E stain, 40X).

Examination under the microscope revealed that the cells were spherical in shape, with vesicular nuclei, conspicuous nucleoli, and granular eosinophilic cytoplasm. There was just one case of an adenoma called a trabecular adenoma, and in that case, the cells were also organised in a trabeculae pattern. The hyaline materials were present both within and outside of the cells of the trabecular adenoma (Fig.2).

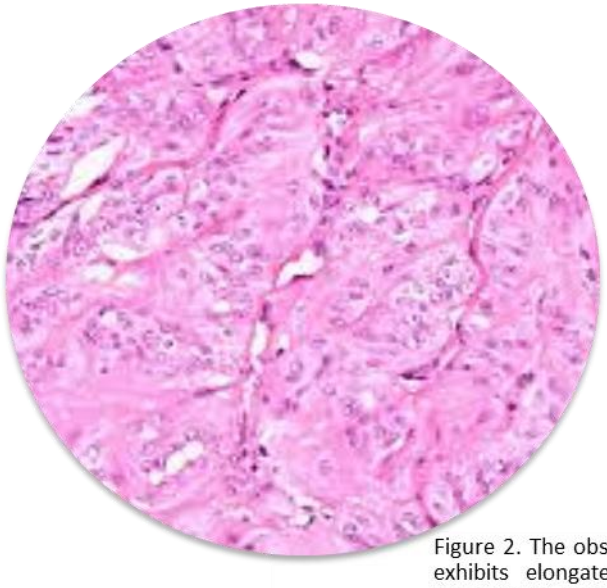

Figure 2. The observed specimen is a trabecular adenoma that exhibits elongated cells arranged in a trabecular pattern. Additionally, both intra- and extra-cellular hyaline materials are present (H &E stain, 40X).

The provided visual aid, Figure 3, displays photomicrographs of colloid goitre. The images depict thyroid follicles of diverse sizes that contain colloid.

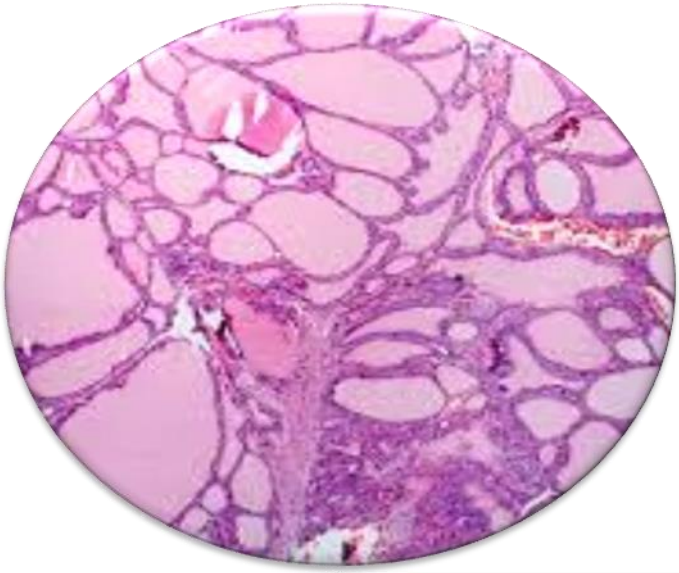

Figure 3, displays photomicrographs of colloid goitre. The images depict thyroid follicles of diverse sizes that contain colloid (H &E stain, 40X)

The prevalence of Graves' disease, also known as toxic goiter, accounted for 4.0% of the total cases examined. The aforementioned figure exhibits a marginal increase in comparison to the rates of 1.5% and 1.4% reported by (28,29) respectively, for Port Harcourt and Ile-Ife, and 0.91% reported by Hussain et al. (30) for Karachi. However, it is consistent with the rates of 3.1% and 5.4% reported in Enugu and Kano, respectively (31,32). The highest occurrence of this phenomenon was observed in individuals in their third decade of life, with a male-to-female ratio of 1:5.

The prevalent thyroid disorder observed in the study was colloid goitre, as depicted in Figure 3, with a total of 83 cases (68%). The prevalence of the condition in question was reported by various authors in different regions of Nigeria and Ethiopia. Specifically, (33) reported a prevalence of 75% in Ile-Ife, Southwest Nigeria,(28) reported a prevalence of 59.4% in Port Harcourt, South-South Nigeria, and (34) reported a prevalence of 63.2% in Enugu, Southeast Nigeria. Frequencies of 80% and 76.9% were also reported by (35), (36), both of whom were located in Ethiopia. Iodine deficiency, which is common in mountainous regions like Ethiopia, may explain the higher-than-average rates recorded there.

Conclusion:

The prevalence of thyroid diseases in Iraq exhibited a higher incidence among females during the 4^{th} and 5^{th} decades of life. Colloid goiter, adenoma, and papillary carcinoma were identified by hsitopathology as the prevailing diseases.

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