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RESEARCH ARTICLE

Patterns of thyroid disorders among patients attending an endocrine clinic in Dhaka city

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Abstract

Background: Data on the presentation patterns of thyroid disorders are almost lacking in Bangladesh. We present here the data of an Endocrine Outpatient Clinic based in Dhaka city.

Methods: We reviewed data from the electronic health records of an Endocrine Outpatient Clinic in Dhaka, Bangladesh, over a two-year period. Thyroid function status was interpreted according to the reference range of the corresponding laboratory and classified according to the International Classification of Diseases 11th Revision (ICD-11).

Results: Among 3140 patients, 1015 (32.3%) had thyroid disorders. The age of patients with thyroid disorders ranged from 1 to 84 years, with a median age of 36.0 years (interquartile range: 28.0–48.0 years), and 802 (79.0%) were female. Hypothyroidism [overt hypothyroidism, n=568 (56.0%) and subclinical hypothyroidism, n=281 (27.7%)] was the most common thyroid disorder, followed by thyrotoxicosis (106; 10.4%). Graves' disease (n=68; 6.7%) was the most common cause of thyrotoxicosis, followed by toxic multinodular goitre (n=12; 1.2%). Structural abnormalities with euthyroid status were present in 42 (4.1%) patients. Those with overt hypothyroidism had a higher age (38.0 vs. 34.0 years; P <0.001). Diabetes and hypertension were co-existent. Participants with nodular goitre had a higher mean age (47.1 versus 37.9 years; P =0.14).

Conclusion: Thyroid disorders account for one-third of patients who attended an Endocrine Outpatient Clinic, with the predominance of overt hypothyroidism, followed by subclinical hypothyroidism, and thyrotoxicosis.

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Key messages

One-third of patients who attended the Endocrine Clinic in Dhaka city have thyroid disorders. There is a female predominance (79.0%) of among patients with thyroid disorders. The most common pattern is overt hypothyroidism (56.0%), followed by subclinical hypothyroidism (27.7%), Graves' disease (6.7%), and structural abnormalities with euthyroid (4.1%) status.

Introduction

Nearly 200 million people worldwide are estimated to have thyroid disorders [1]. These issues are most often caused by iodine deficiency in areas where iodine is lacking, and by autoimmune thyroid conditions where iodine intake is sufficient. Surprisingly, one-third of the global population still lives in iodine-deficient regions [2]. In areas with enough iodine, hypothyroidism affects about 1% to 2% of people, while hyperthyroidism is seen in 0.2% to 1.3%. Moreover, the percentage of palpable thyroid nodules in the general population is 4% to 7% [3]. In Bangladesh, although the exact numbers are unknown, it's estimated that approximately 20% of the population may have some form of thyroid disorders but half of them are unaware of their condition [4]. Asymptomatic and mild cases are often neglected and out of medical attention. However, patients visiting specialised endocrine clinics usually have severe and complex problems, providing important insights into the challenges of diagnosing and managing these disorders. This study aimed to understand the range of thyroid disorders seen at on Endocrine clinic.

Methods

Study population

We have a specialised endocrinology outpatient clinic at Uttara, Dhaka, Bangladesh. The clinic keeps clinical and demographic details of the patients' electronic health records. We included all consecutive patients with any thyroid disorder who visited the clinic between 30 August 2022 and 15 December 2024. Of these, 1,015 patients (male and female) were identified as having thyroid disorders of any age. Among them, 217 (21.3%) patients with type 2 diabetes were reported elsewhere [5].

Classifications and diagnosis of thyroid disorders

The diagnosis of thyroid disorders was made either based on previous medical records or a recent investigation of thyroid function based on clinical presentations of the patients. Disorders of the thyroid gland were classified according to the ICD-11 for Mortality and Morbidity Statistics [6]. Estimation of TSH and FT4 was carried out using an indirect chemiluminescence method for newly diagnosed cases. For non-pregnant adults, a TSH range 0.35–5.5 µIU/mL, FT4: 0.78–2.19 ng/dL, and FT3: 2.30–4.20 pg/mL were considered normal. Thyroid ultrasonogram findings were used to define structural thyroid disease in suspected cases. In hyperthyroid patients, TSH

Table 1 The type of thyroid disorders among patients attending an endocrine outpatient department according to International Classification of Diseases, 11th revision, ICD -11 (n=1015)

ICD-11	Number (%)
5A00 Hypothyroidism (n=858)	
5A00.0 Congenital hypothyroidism	
5A00.01 Permanent congenital hypothyroidism without goitre	4 (0.4)
5A00.2 Acquired hypothyroidism (n=849)	
5A00.2Y Other specified acquired hypothyroidism (Primary acquired hypothyroidism)	568 (56.0)
5A00.2Z Acquired hypothyroidism, unspecified (Subclinical hypothyroidism)	281 (27.7)
5A61.40 Acquired central hypothyroidism	5 (0.5)
5A01 Nontoxic goitre (n=36)	
5A01.0 Nontoxic diffuse goitre	14 (1.4)
5A01.1 Nontoxic single thyroid nodule	11 (1.1)
5A01.2 Nontoxic multinodular goitre	11 (1.1)
5A02 Thyrotoxicosis (n=106)	
5A02.0 Thyrotoxicosis with diffuse goitre (Graves' disease)	68 (6.7)
5A02.1 Thyrotoxicosis with toxic single thyroid nodule	2 (0.2)
5A02.2 Thyrotoxicosis with toxic multinodular goitre	12 (1.2)
5A02.Y Other specified thyrotoxicosis (n=8)	
Subclinical thyrotoxicosis	4 (0.4)
Gestational thyrotoxicosis (JB44.5)	4 (0.4)
5A02.Z Thyrotoxicosis, unspecified (Thyrotoxicosis under evaluation)	16 (1.6)
5A03 Thyroiditis (n=8)	
5A03.1 Subacute thyroiditis	8 (0.8)
JB44 Certain specified complications of the puerperium (n=1)	
JB44.5 Postpartum thyroiditis	1 (0.1)
DA05 Cysts of oral or facial-neck region (n=1)	
DA05.Y Other specified cysts of oral or facial-neck region (Thyroglossal duct cyst)	1 (0.1)
2D10 Malignant neoplasms of thyroid gland (n=5)	
2D10.0 Follicular carcinoma of the thyroid gland	1 (0.1)
2D10.1 Papillary carcinoma of the thyroid gland	4 (0.4)
Total	1015

Table 2 Number (%) of overt primary and subclinical hypothyroidism (n=849)

Characteristics	Total (n=849)	Overt primary hypothyroidism (n=568)	Subclinical hypo-thyroidism (n=281)	*P*
Age, years				
<18 years	54 (6.4)	26 (4.6)	28 (10.0)	0.002
≥18 years	795 (93.6)	542 (95.4)	253 (90.0)	
Sex				
Female	684 (80.6)	465 (81.9)	219 (77.9)	0.17
Male	165 (19.4)	103 (18.1)	62 (22.1)	
Co-morbidities				
Diabetes mellitus	229 (27.0)	173 (30.5)	56 (19.9)	0.001
Hypertension	348 (41.0)	258 (45.4)	90 (32.0)	<0.001

receptor antibody (TRAb), thyroid scan, and radioactive iodine uptake were used as appropriate to differentiate Graves' disease from other causes of thyrotoxicosis. We used the following criteria to diagnose different types of thyroid disorders in non-pregnant adults:

a) Subclinical hypothyroidism (SCH): FT4= 0.78–2.19 ng/dL and TSH=5.5 to <20.0 µIU/mL
b) Overt primary hypothyroidism: FT4 <0.78 ng/dL and TSH ≥20.0 µIU/mL
c) Secondary hypothyroidism: FT4 <0.78 ng/dL and TSH= undetectable to <20.0 µIU/mL
d) Subclinical thyrotoxicosis: FT4 = 0.78–2.19 ng/dL and TSH <0.35 µIU/mL
e) Primary thyrotoxicosis: FT4 >2.19 ng/dL and TSH <0.35 µIU/mL
f) Solitary thyroid nodule and multinodular goitre – diagnosed based on ultrasonogram and thyroid scan findings
g) Thyroid malignancy- diagnosed by histopathology. In case of Pregnancy, children, and adolescents, specific laboratory values were used in this group of patients.

Statistical analysis

Data were analysed using SPSS software (version 25.0). Continuous variables were expressed as the mean ± standard deviation (SD), or median with interquartile range (IQR), depending on their distribution. Categorical variables were presented as numbers and percentages.

Results

We present the data of 1015 (32.3%) patients who had a functional or structural thyroid disorders. Table 1 shows the spectrum of thyroid disorders according to ICD-11. The predominant disorders were acquired hypothyroidism (83.7%), thyrotoxicosis with diffuse goitre (6.7%), and different types of nontoxic goitres (3.6%). Four patients had congenital hypothyroidism without goitre. Among 36 patients with nontoxic goitre, 14 had diffuse goitre, and the frequency of single and multinodular goitre was 11 for both. Sixteen patients presented with thyrotoxicosis; however, they were lost to follow-up. Eight patients had a diagnosis of subacute thyroiditis. Among five patients with malignant neoplasms, four had papillary carcinoma and one had follicular carcinoma of the thyroid. Uncommon disorders included subclinical thyrotoxicosis (n=4), gestational thyrotoxicosis (n=4), postpartum thyroiditis (n=1), and thyroglossal duct cyst (n=1), etc. The predominant etiologies of hypothyroidism were primary acquired hypothyroidism (n=568) and subclinical hypothyroidism (n=281).

Table 3 Number (%) of goitre types (n=82)

Characteristics	All goitres (n=82)	Diffuse goitres (n=68)	Nodular goitres (n=14)	*P*
Age, years				
<18 years	2 (2.4)	2 (2.9)	0 (–)	0.99
≥18 years	80 (97.6)	66 (97.1)	14 (100.0)	
Sex				
Female	61 (74.4)	51 (75.0)	10 (71.4)	0.75
Male	21 (25.6)	17 (25.0)	4 (28.6)	
Co-morbidities				
Diabetes mellitus	21 (25.6)	14 (20.6)	7 (50.0)	0.04
Hypertension	30 (36.6)	26 (38.2)	4 (28.6)	0.49

The median age of the subjects were 36 years (interquartile range, 28.0–48.0) Those with overt primary hypothyroidism had higher age (*P* =0.002) as well as higher frequencies of diabetes (*P* =0.001) and hypertension (*P* <0.001) (Table 2) . The predominant causes of thyrotoxicosis were thyrotoxicosis with diffuse and nodular goitre (single or multiple). Participants with nodular goitre had a higher mean age and frequency of DM (*P* <0.04) than those with diffuse goitre with thyrotoxicosis (Table 3).

Discussion

There is hardly any published database on thyroid disorders in Bangladesh. The dataset we present here is one of the few available. We believe that publication of other datasets would provide a broader evidence base for future use in generating hypotheses for further research.

The most common thyroid disorder in the study population was acquired hypothyroidism, followed by thyrotoxicosis with diffuse goitre and various nontoxic goitre. These findings align with the global data, where acquired hypothyroidism remains the leading thyroid disorder. In general, hypothyroidism affects up to 5% of the general population, and over 99% of affected people suffer from acquired hypothyroidism. Iodine deficiency is the top cause of thyroid disorders worldwide. Yet, where iodine is sufficient, Hashimoto's thyroiditis (an autoimmune disease) is the most common cause of thyroid failure [7]. Primary acquired hypothyroidism (56%) was the most common thyroid issue in this analysis, with subclinical hypothyroidism (27.7%) also being a major contributor, highlighting the importance of detecting these often symptomless cases due to potential long-term risks. Missing data on several variables limits our effort to generate hypotheses, e.g., thyroid autoantibodies and iodine levels [8].

The data from Kerala, India, provides a contrasting picture, the most common type of thyroid disorder there is non-toxic multinodular goitre (48.5%), followed by hypothyroidism (18.1%) [9]. Development of nodular thyroid enlargement is multi-factorial; goitrogens, iodine deficiency, malnutrition, and genetic factors might contribute, and these factors

probably differ from patient to patient and have geographical variation [10]. In our data, there was a relatively lower prevalence of thyrotoxicosis, including Graves' disease (diffuse goitre) and toxic multinodular goitre. The prevalence of goitre and iodine deficiency in Bangladesh has been considerably reduced over the last two decades due to the "Universal Salt Iodization Programme" and autoimmunity is currently the leading cause of thyroid disorders [4]. There is a paucity of patients with sub-acute thyroiditis, gestational thyrotoxicosis, and postpartum thyroiditis, all of which were relatively rare. Data from other outpatient endocrinology settings indicate that thyroid malignancies are relatively common [11].

Children predominantly presented with subclinical hypothyroidism. Hypothyroidism in children and adolescents has deleterious effects on physical growth, mental development, and school performance, which may lead to more investigations among this age group, which possibly could have contributed to more cases of undiagnosed subclinical hypothyroidism [12, 13]. Overt primary hypothyroid patients were found to be more likely to have diabetes and hypertension compared to subclinical hypothyroidism [14, 15]. Thyrotoxicosis patients with nodular goitre were predominantly older than thyrotoxicosis with diffuse goitre, which was a typical picture we are familiar with.

Limitation

The data are generated from a single outpatient clinic, which limits their generalisability. We couldn't classify hypothyroidism types due to a lack of autoantibody and urinary iodine data. There are some missing values to confirm the diagnosis.

Conclusion

Our findings are valuable as the first large-scale report on thyroid disorders in Bangladesh, providing a foundation for future research. The one-third patients who seek services at the endocrine clinic have thyroid disorders. There is a predominance of overt hypothyroidism, following by subclinical hypothyroidism and thyrotoxicosis.

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Author contributions

Concept and design of the study: MRH, RS, SAM, MSM, MFA. *Acquisition, analysis, and interpretation of data:* MRH, RS, SAM, MSM. *Manuscript drafting and revising it critically:* MRH, MSM, MFA. *Approval of the final version of the manuscript:* MRH, RS, SAM, MSM, MFA. *Guarantor accuracy and integrity of the work:* MRH

Conflict of interest

We do not have any conflict of interest.

Data availability statement

We confirm that the data supporting the findings of the study will be shared upon reasonable request.

Supplementary file

None

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