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ORIGINAL ARTICLE

PATTERN OF THYROID DISORDERS AMONG PATIENTS IN HAZARA DIVISION, PAKISTAN

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ABSTRACT

Background: Thyroid disorders are a commonly encountered problem in hilly areas of Pakistan. The objectives of the study were to determine the frequency and distribution of thyroid disorders among patients presenting with suggestive signs & symptoms of thyroid disorders in Hazara Division, Pakistan.

Material and Methods: This cross-sectional study was conducted in Departments of Medicine and Pediatrics & Neonatology, Ayub Medical College, Abbottabad, KP, Pakistan from January, 2017 to January, 2018. Exclusion criteria was patients taking medicines such as Lithium and Cordarone. Sample size was 55 selected using consecutive sampling technique. Reference values were taken as follows; serum TSH=0.4-4.0 μIU/L, serum T3=100-200 ng/dL), serum T4=5-13.5 μgm/dL. Demographic variables were sex and age. Research variables were thyroid status (euthyroid/ hyperthyroid/ hypothyroid) and levels of thyroid function tests (TFT). Categorical variables such as sex and thyroid status were calculated by frequency and percentages whereas numeric variables such as age and TFT by Mean and SD. Descriptive statistics were calculated using SPSS Version 20.

Results: Out of the total 55 patients, 11 patients were males and 44 patients were females. The minimum age was 20 years, maximum age was 90 years. Mean age was 43.24 years±15.118. Out of the total 55 patients, 14 (25.5%) were euthyroid, 30 patients (54.5%) were hyperthyroid and 11 (20%) patients were hypothyroid. Out of the 14 patients that were euthyroid, seven were males and seven were females. Out of the 30 hyperthyroid patients 26 were females and only 4 were males. All 11 hypothyroid were females.

Conclusions: Hyperthyroidism is more common thyroid disorder in Hazara Division specially in adult females.

KEY WORDS: Thyroid Gland; Hypothyroidism; Hyperthyroidism; Goiter.

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INTRODUCTION

Most common clinical forms of thyroid disorders are goiter associated hypothyroidism, autoimmune hypothyroidism, pregnancy associated thyroid disorders and benign adenomas. In hilly areas hypothyroidism is expected to be more prevalent as compared to hyperthyroidism. Consumption of naturally occurring goitrogens like soya bean, millets, sweet-potato, broccoli, especially cabbage and cauliflower leads to thyroid disorders here. Deficiency of iodine in water resources is also an important factor.[1] In Pakistan there is lack of newborn screening as a routine test even in babies delivered in tertiary care hospitals; resultantly undiagnosed cases of congenital hypothyroidism and cretins can still be seen. In teenage population autoimmune thyroiditis is frequently encountered which can present as hyperthyroidism and later as hypothyroidism. Chronic Lymphocytic thyroiditis is considered to be the most common thyropathy among children and adolescents. It is the main cause of nontoxic goiter.[2, 3] Introduction of iodine in diet might be the reason for increase in number of iodine related hyperthyroidism.[4]

Normal synthesis of thyroid hormones in our body is multi stepped and requires optimally functioning thyroid gland, normal hypothalamic pituitary thyroid axis and sufficient intake of dietary iodine. During pregnancy and lactation, normal levels change. Intake of antithyroid medications in pregnancy can lead to congenital hypo or hyperthyroidism in newborn. Other causes such as autoantibodies alone or in patients with autoimmune polyglandular syndromes further complicate the presentations.[5]

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Daily intake of iodine in adult population as recommended by WHO is 150 μgm. In pregnancy it increases to 250μgm and up to 290μgm in lactating mothers. At present one third of world population lives in areas of iodine deficiency. When daily intake of iodine reaches less than 50 μgm, goiter is endemic. According to WHO, 2 billion people including 285 million school aged children are reported to have iodine deficiency. It has an impact upon growth and development of children and is the most common cause of mental impairment globally.[6] When daily intake reaches below 25 μgm congenital hypothyroidism is evident.[6,7] Mental retardation due to congenital hypothyroidism can be prevented by early diagnosis by newborn screening and immediate treatment.[8] Congenital hypothyroidism is one of the most common congenital diseases, with an incidence of 1/4,000 newborns. So newborn screening for hypothyroidism in developing countries is must. Clinical presentation of hypothyroidism depends upon etiology and age of the patient. In overt hypothyroidism which may go unnoticed, serum TSH levels are raised along with decreased T_3 and T_4, but in subclinical hypothyroidism typical symptoms are absent with normal T_3, T4 and a raised TSH>5μU/L Hypothyroidism is reportedly more common in women and has a total prevalence of 1% to 2%, and prevalence increases with age to approximately10% in adults over 65 years of age. In the U.S the prevalence of subclinical (biochemical) hypothyroidism is about 4.6% and overt clinical hypothyroidism is 0.3%.[9,10]

In mild hypothyroidism nonspecific symptoms such as malaise, fatigue, intolerance to cold, weight gain and myalgia may be present. Hypothyroidism should be considered in differentials and tested for in these cases. Signs and symptoms such as bradycardia, chronic constipation, menstrual problems, skin and hair changes, periorbital edema, slowing of tendon reflexes relaxation and clouded memory are present in more overt cases. Hypothyroidism can be associated with diastolic dysfunction of the left ventricle and higher diastolic blood pressure. Most serious complication that is rare nowadays is Myxedema coma; these patients have significant hypothermia and bradycardia. Mortality is 100% if not treated.[11]

Hashimoto's thyroiditis is autoimmune and the most common cause of post pubertal hypothyroidism. Females are affected 4 to 10 times than males. It is more prevalent in areas with high dietary iodine. Initially a uniform goiter is seen; later thyroid atrophy is more common. It may be a part of autoimmune polyglandular.Labs show elevated TSH, low T4 and antithyroid peroxidase antibodies. Other causes include hypothyroidism induced by Amiodarone and postpartum hypothyroidism.[12]

Subclinical hyperthyroidism a reduced serum TSH is present along with normal range T3 and triiodothyronine levels. Overt thyrotoxicosis prevalence is about 0.5% and 1% to 2% of patients may have a TSH level that is below normal. Presentation of thyrotoxicosis depends upon the level of excess thyroid hormone, patient's age and duration of the disease. Low levels of TSH are seen in 3% of the > 80 year age population.[13]

Hall mark features may be present according to etiology such as exophthalmos in Graves' disease, which is autoimmune and the most common cause of thyrotoxicosis. It's common in whites and Asians. Females have 3.5 times more chance of being affected. Positive family history especially of Graves' disease is a risk factor. Toxic multinodular goiter (MNG) is presence of two or more thyroid nodules that secrete excess thyroid. Iodine-containing drugs such as IV contrast dye and Amiodarone if taken can worsen the condition in MNG.With an insidious onset of hyperthyroidism, weight loss, atrial fibrillation, and depression is present. In thyroiditis preformed hormone can be released leading to thyrotoxicosis. It is transient followed by either recovery or hypothyroidism. About half of the patients with sub-acute and postpartum thyroiditis will eventually have permanent hypothyroidism. Jod-Basedow phenomenon is induction of hyperthyroidism following administration of a large load of iodine to a susceptible patient. Signs and symptoms are mostly mild with spontaneous resolution.[13] Amiodarone may induce hyperthyroidism, observed in 3% of patients[14].Hyperthyroidism also can be caused by destructive thyroiditis. In thyroiditis the hyperthyroid phase can take up to several months.[14,15] The objectives of the study were to determine the frequency and distribution of thyroid disorders among patients presenting with suggestive signs & symptoms of thyroid disorders in Hazara Division, Pakistan.

MATERIALS AND METHODS

This cross-sectional study was conducted in Departments of Medicine and Pediatrics & Neonatology, Ayub Medical College, Abbottabad, KP, Pakistan from January, 2017 to January, 2018. Data was collected from tertiary care hospital catering patients from Hazara Division such as Haripur, Abbottabad, Mansehra, Battgram and Kohistan.

Inclusion criteria was male and female patients over the age of 12 years, presenting with signs and symptoms suggestive of thyroid related illness such as depression, weight gain, constipation, fatigue, skin or hair changes, cold intolerance or weight loss, diarrhea, palpitations, sweating, altered mentation, confusion. Exclusion criteria was patients taking medicines such as Lithium and Cordarone. Sample size was 55 selected using consecutive sampling technique. Reference values were taken as follows; serum TSH=0.4-4.0 μIU/L, serum T3=100-200 ng/

dL), serum T4= 5 - 13.5 μgm/dL. Demographic variables were sex and age. Research variables were thyroid status (euthyroid/ hyperthyroid/ hypothyroid) and levels of thyroid function tests (TFT). Categorical variables such as sex and thyroid status were calculated by frequency and percentages whereas numeric variables such as age and TFT by Mean and SD. Descriptive statistics were calculated using SPSS Version 20.

RESULTS

Out of the total 55 patients, 11 (20%) patients were male and 44 (80%) were females (Figure 1). The minimum age was 20 years, maximum age was 90 years. Mean age was 43.24 years±15.118. Table 1

Table 1: Age of patients with thyroid disorders in Hazara Division, Pakistan (n=55).

Summary measures	Age (in years)
Mean	43.24
SD	15.118
Range	70
Minimum	20
Maximum	90

Out of the total 55 patients, 14 (25.5%) were euthyroid, 30 patients (54.5%) were hyperthyroid and 11 (20%) patients were hypothyroid. Table 2

Out of the 14 patients that were euthyroid, seven were males and seven were females. Out of the 30 hyperthyroid patients 26 were females and only 4 were males. All 11 hypothyroid were females. (Table 3). Thyroid function tests of the sample are given in table 4.

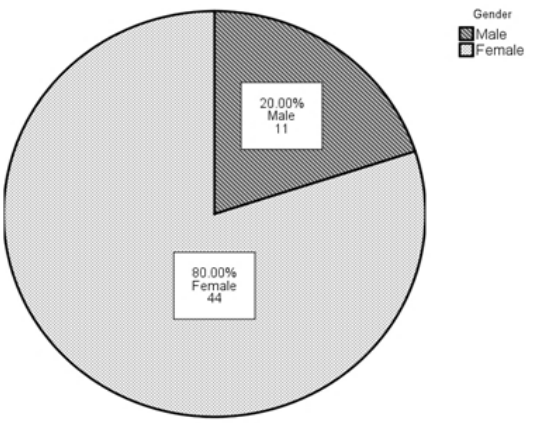

Figure 1: Gender wise distribution of thyroid patients in Hazara Division, KP, Pakistan (n=55).

Table 2: Pattern of thyroid disorders among patients in Hazara Division, Pakistan (n=55).

Disorder	Observed count (O)	Expected count (E)	(O-E)	$(O-E)^2$	$O-E^2/E$
Euthyroid	14	18.15	-4.15	17.22	0.96
Hyperthyroid	30	18.15	11.85	140.42	7.74
Hypothyroid	11	18.70	-7.70	59.29	3.717
Total	55	55	0	Df=2 χ^2=11.85	p=.002

Table 3: Thyroid status across gender among patients in Hazara Division, Pakistan (n=55).

Gender	Euthyroid	Hyperthyroid	Hypothyroid	Row total
Male	7	4	0	11
Female	7	26	11	44
Column total	14	30	11	Grand total 55

Table 4: Thyroid function tests of the sample in Hazara Division, Pakistan (n=55).

	Mean	Minimum	Maximum	SD
T3 (ng/dL)	14.412	0.150	120.95	3.1535
T4 μgm/dL	9.556	0.460	80.013	1.3333
TSH (μIU/L	24.220	0.0010	847.00	1.1611

DISCUSSION

In our study a female preponderance was noted especially in cases of hypothyroidism. In previous studies done in KP, it was concluded that the frequency of hyperthyroidism and subclinical hyperthyroidism was 5.1 % and 5.8% respectively, frequency of hypothyroidism and subclinical hypothyroidism was 4.1% and 5.4% respectively. Frequency of hyperthyroidism and subclinical hyperthyroidism was higher in females than males and prevalence of hypothyroidism and subclinical hypothyroidism was also higher in females as compared to males[16]. Thyroid disorders were found to be more prevalent in female population as compared to males (75.8% versus 24.2%).[17]

In another study done in Peshawar the frequency of thyroid dysfunction was found to be higher in female as compared to male population.[18]

The study confirmed several reports of a clear female gender predisposition to thyroid disease [19,20] . In a study conducted in central Ghana, females represented about 72% of the total thyroid admissions. Ghana, an initial area with a moderate-severe iodine deficiency instituted mandatory iodization in 1996.[4,21] The results confirm that iodine supplementation especially in regions of moderate-severe iodine deficiency increase the incidence of overt hyperthyroidism from toxic adenoma, toxic multinodular goiter, and Graves' disease. Autoimmune disorders by also have a predilection in females.

In one study it was concluded that there is a need for early recognition, detection and intervention of thyroid disorders, especially subclinical hypothyroidism, which is considered the most prevalent thyroid disorder in females aged over 50. In these females and in other people who present with nonspecific symptoms which do not fulfilling the criteria for psychiatric disorders e.g. depression or anxiety: screening for thyroid disorders should be done and is a simple option. Screening for thyroid disorders in these patients could be done by measuring the TSH and FT_4 levels.[22]

The importance of screening for thyroid disorders was also asserted in a systemic evidence review and it was suggested that the ability of screening programs to detect subclinical thyroid dysfunction was demonstrated in good-quality cohort studies, and its benefits can't be denied as complications of subclinical thyroid dysfunction are well documented and can be avoided.[23]

CONCLUSIONS

Hyperthyroidism is more common thyroid disorder in Hazara Division specially in adult females.

REFERENCES

1. Kansa P. Thyroid swellings. a common problem in hilly areas - IOSR Journal of Dental and Medical Sciences (IOSR-JDMS) e-ISSN: 2279-0853, p-ISSN: 2279-0861. 2014;13(5):88-90.
2. Setian NS. Review article. Hypothyroidism in children: diagnosis and treatment . J Pediatr (Rio J) Porto Alegre 2007;83:209-16. https://doi.org/10.2223/JPED.1716
3. Rakhee M. Thyroid problems in teens - causes, symptoms, diagnosis. https://www.momjunction.com/articles/thyroid-problems-in-teens_00379290/#gref
4. Sarfo-Kantanka O, Kyei I, Sarfo FS, Ansah EO. "Thyroid disorders in central Ghana: The influence of 20 years of iodization," J Thyroid Res 2017, Article ID 7843972, 8 pages. https://doi.org/10.1155/2017/7843972
5. Salvatore D, Davies TF, Schulmberger MJ. Williams text book of Endocrinology-Thyroid physiology and diagnostic evaluation of patients with thyroid disorders.12th editions. Chapter 11 pg340 -7.
6. UNICEF. The roadmap towards achievement of sustainable elimination of iodine deficiency. Operational Guidance: 2005 and beyond. United Nations Children's Fund: New York; 2005.
7. Zimmerman MB. Iodine deficiency. Endocr Rev, 2009;30:376-408. https://doi.org/10.1210/er.2009-0011
8. Kliegman RM, Stanton B, St Geme J, Nina F, Richard E. Nelson textbook of pediatrics 19th ed. Chapter 568.3. Stephen A.H, Stephen H.L, Hypothyroidism pg 275-7.
9. Canaris GJ, Manowitz NR, Mayor G, Ridgway EC. The Colorado thyroid disease prevalence study. Arch Intern Med 2000;160:526-34. https://doi.org/10.1001/archinte.160.4.526
10. Hollowell JG, Staehling NW, Flanders WD, Hannon WH, Gunter EW, Spencer CA, et al. Serum TSH, T4, and thyroid antibodies in the United States population (1988 to 1994): National Health and Nutrition Examination Survey (NHANES III). J Clin Endocrinol Metab 2002;87:489-99. https://doi.org/10.1210/jcem.87.2.8182
11. Biondi B, Klein I. Hypothyroidism as a risk factor for cardiovascular disease. Endocrine 2004;24:1-13. https://doi.org/10.1385/ENDO:24:1:001
12. Cooper DS. Antithyroid drugs for the treatment of hypothyroidism caused by Graves' disease. Endocrinol Metab Clin North Am 1998;27:225-47. https://doi.org/10.1016/S0889-8529(05)70308-X
13. McQuade C, Skugor M, Brennan DM, Hoar B, Stevenson C, Hoogwerf BJ. Hypothyroidism and moderate subclinical hypothyroidism are associated with increased all-cause mortality independent of coronary heart disease risk factors: a PreCIS database study. Thyroid. 2011;21(8):837-43. https://doi.org/10.1089/thy.2010.0298
14. Benbassat CA, Mechlis-Frish S, Cohen M, Blum I. Amiodarone-induced thyrotoxicosis type 2: a case report and review of the literature. Am J Med Sci 2000;320:288-91. https://doi.org/10.1016/S0002-9629(15)40842-0

15. Glinoer D. The regulation of thyroid function during normal pregnancy: importance of the iodine nutrition status. Best Pract Res Clin Endocrinol Metab 2004;18:133-52. https://doi.org/10.1016/j.beem.2004.03.001
16. Alam K, Shamim A, Khattak MMAK. Thyroid disorders, etiology and prevalence J Med Sci 2002; https://doi.org/10.3923/jms.2002.89.94
17. Attaullah S, Haq BS, Muska M. Thyroid dysfunction in Khyber Pakhtunkhwa, Pakistan. Pak J Med Sci 2016;32(1):111-15. https://doi.org/10.12669/pjms.321.8476
18. Yousaf M, Shah J, Jan MR. Frequency of thyroid dysfunctions in general population of Peshawar city and its association with serum alanine transaminase level. Isra Med J 2017;9:84-7.
19. Tunbridge WM, Evered DC, Hall R, Appleton D, Brewis M, Clark F, et al. The spectrum of thyroid disease in a community: the Whickham survey. Clinical Endocrinol 1977;7:481-93. https://doi.org/10.1111/j.1365-2265.1977.tb01340.x
20. Okosieme E. Impact of iodination on thyroid pathology in Africa, J Royal Soc Med 2006;99:396-401. https://doi.org/10.1177/014107680609900816
21. Nyumuah RO1, Hoang TC, Amoaful EF, Agble R, Meyer M, Wirth JP, et al. Implementing large-scale food fortification in Ghana: lessons learned. Food Nutr Bull 2012;33:293-300. https://doi.org/10.1177/15648265120334S305
22. Benseñor I. Screening for thyroid disorders in asymptomatic adults from Brazilian populations. Sao Paulo Med J 2002;120(5):146-51. https://doi.org/10.1590/S1516-31802002000500005
23. Helfand M. Medicare coverage of routine screening for thyroid dysfunction. Screening for thyroid disease: Systematic evidence review. https://www.ncbi.nlm.nih.gov/books/NBK221542

CONFLICT OF INTEREST
Authors declare no conflict of interest.
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AUTHORS' CONTRIBUTION

The following authors have made substantial contributions to the manuscript as under:

Conception or Design:	NHSK, SG
Acquisition, Analysis or Interpretation of Data:	NHSK, SG, AR, HZ
Manuscript Writing & Approval:	NHSK, SG, SN, IA

All the authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.