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A Prospective Observation of Clinical Presentation and Management Strategies for Thyroid Disorders An Institutional Study

[1]Dweethi Jayaprakash, [2]Loka Arun Kumar, [3]K.V. Santosh Reddy and [4]Rathod Sunil kumar

[1,4]Department of ENT, Government Medical College, Nirmal, Telangana India

[2,3]Department of Orthopedics, Government Medical College, Nirmal, Telangana India

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Corresponding Author
Rathod Sunil kumar,
Department of ENT, Government Medical College, Nirmal, Telangana India
drsunilkmc@gmail.com

Author Designation
[1-3]Assistant Professor
[4]Associate Professor

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ABSTRACT

Thyroid disorders encompass a wide range of endocrine conditions that significantly impact metabolic processes and overall health. With a varied clinical presentation and management strategies, these disorders present a complex challenge for healthcare providers. This study aims to systematically document the clinical presentation of patients with thyroid disorders and evaluate the management strategies employed, thereby enhancing our understanding of disease patterns and treatment outcomes. In this prospective observational study, 75 patients diagnosed with thyroid disorders were enrolled from the Department of Otolaryngology-Head and Neck Surgery (ENT) at our institution. Data were collected through structured questionnaires and electronic medical records, including demographic information, clinical presentation, diagnostic findings (thyroid function tests, ultrasound, CT, MRI) and management strategies (medical, surgical and adjunctive treatments). Statistical analyses were performed to summarize the data and evaluate the effectiveness of management strategies. The study cohort predominantly comprised females (73.3%) with a mean age of 48 years. Hypothyroidism (46.7%) and hyperthyroidism (33.3%) were the most common diagnoses. Diagnostic findings revealed a mean TSH level of 4.5 mIU/L and frequent detection of thyroid nodules (60%) by ultrasound. Management strategies were diverse, with Levothyroxine therapy (53.3%) being the most common treatment, followed by antithyroid medications (26.7%), radioactive iodine therapy (20%) and surgical interventions (20%). Overall, 80% of patients reported an improvement in symptoms, with 40% expressing high satisfaction with their treatment. This study underscores the complexity of diagnosing and managing thyroid disorders, highlighting the importance of individualized treatment plans. The high prevalence of thyroid nodules and the effective use of various management strategies reflect current trends in thyroid disorder care. The findings advocate for continuous evaluation and optimization of management practices to improve patient outcomes and satisfaction.

INTRODUCTION

Thyroid disorders constitute a significant public health issue, with a global prevalence that underscores their impact on health systems and patient populations worldwide. These conditions emerge from dysfunctions in the thyroid gland an essential organ in the endocrine system responsible for the production of thyroid hormones, which regulate metabolic processes, energy balance, and growth and development[1]. The spectrum of thyroid disorders encompasses hypothyroidism, hyperthyroidism, thyroid nodules and thyroid cancer, each presenting unique challenges in diagnosis and management[2]. Thyroid disorders affect a diverse demographic, transcending age, gender and geographic boundaries. The etiology of these conditions can be attributed to a combination of genetic, autoimmune and environmental factors[3]. For instance, autoimmune thyroiditis (Hashimoto's disease) leads to hypothyroidism and is characterized by an immune-mediated destruction of thyroid tissue. Conversely, Graves' disease, another autoimmune condition, often results in hyperthyroidism due to the stimulation of thyroid hormone production. The development of thyroid nodules and cancer, while less common, introduces additional complexity into the clinical landscape of thyroid pathologies, necessitating distinct diagnostic and therapeutic approaches[4,5]. The clinical presentation of thyroid disorders is remarkably varied, reflecting the central role of thyroid hormones in multiple physiological systems. Hypothyroidism may present with fatigue, weight gain, cold intolerance and depression, whereas hyperthyroidism is frequently associated with weight loss, palpitations, heat intolerance and anxiety[6]. The presence of thyroid nodules may be asymptomatic or may manifest through symptoms related to the compression of adjacent structures in the neck. Thyroid cancers, though often detected at an asymptomatic stage through routine examinations or imaging for unrelated reasons, can present with a palpable neck mass, changes in voice and difficulty swallowing[7].

The management of thyroid disorders has evolved to include a broad array of strategies, tailored to the specific diagnosis and patient factors. Hypothyroidism management primarily involves hormone replacement with synthetic thyroxine, aiming to normalize thyroid-stimulating hormone (TSH) levels and alleviate symptoms. Hyperthyroidism treatment options include antithyroid medications, radioactive iodine ablation and thyroidectomy, each with distinct advantages and considerations. The approach to thyroid nodules and cancer typically involves a combination of surgical intervention, radioactive iodine therapy and thyroid hormone suppression therapy, depending on the type and stage of cancer[8]. The present prospective observational studies aimed to document and analyze the clinical features, diagnostic methods and treatment outcomes of thyroid disorder patients presenting at our institution, focusing on efficacy and patient impact. And also identifying disparities in treatment and outcomes across demographics and assess patient satisfaction and quality of life post-treatment, striving for enhanced care and patient well-being.

MATERIALS AND METHODS

This study employed a prospective observational design to investigate the clinical presentation and management strategies of thyroid disorders. Conducted in the Department of Otolaryngology - Head and Neck Surgery (ENT) at our institution, this research was initiated following approval from the Institutional Review Board (IRB). During the study period data collection and patient follow-ups were systematically conducted. Informed consent was obtained from all individual participants included in the study, with assurance of confidentiality and the right to withdraw from the study at any time without any consequences to their medical care. A total of 75 patients diagnosed with various thyroid disorders were enrolled in the study. Inclusion criteria were as follows: patients aged 18 years or older, diagnosed with any thyroid disorder (including hypothyroidism, hyperthyroidism, thyroid nodules and thyroid cancer), and who provided informed consent to participate in the study. Exclusion criteria included patients under 18 years of age, those with a history of thyroid surgery or radioactive iodine treatment prior to the study period and patients unwilling or unable to provide informed consent. Data were collected through a structured questionnaire and review of electronic medical records. The questionnaire was designed to capture detailed information on demographic characteristics, clinical presentation, diagnostic findings, management strategies and patient-reported outcomes. Clinical data included thyroid function tests (TSH, Free T4, Free T3), imaging studies (ultrasound, CT, MRI), biopsy results (if applicable) and details of any surgical interventions. Management strategies were categorized into medical (e.g, hormone therapy, antithyroid medications), surgical and adjunctive treatments like radioactive iodine therapy.

Statistical Analysis: Descriptive statistics were presented as means±standard deviation (SD). A $p<0.05$ will be considered statistically significant.

RESULTS AND DISCUSSIONS

Above results presents a summary of the demographic characteristics and clinical presentations for a cohort of 75 patients diagnosed with various thyroid disorders, observed within the study conducted at the ENT department. The patients' ages ranged widely, with a mean age of 48 years and a standard deviation of 12 years, indicating a middle-aged

population with a considerable age spread. The gender distribution within the cohort was notably skewed towards females, who constituted 73.3% (n = 55) of the participants, compared to males at 26.7% (n = 20). This gender disparity is consistent with the broader epidemiological understanding that thyroid disorders are more prevalent in females. Regarding the clinical presentation of thyroid disorders among the patients, hypothyroidism was the most common diagnosis, affecting 46.7% (n = 35) of the cohort. This was followed by hyperthyroidism in 33.3% (n =25) of the patients, indicating a significant prevalence of both underactive and overactive thyroid function within the study population. Thyroid nodules and thyroid cancer were less common, reported in 13.3% (n = 10) and 6.7% (n = 5) of the patients, respectively, showcasing a spectrum of thyroid-related pathologies from benign conditions to malignancies.

Symptomatically, fatigue was the most frequently reported symptom, experienced by 86.7% (n = 65) of the patients, highlighting the profound impact of thyroid disorders on energy levels and overall well-being. Weight change, encompassing both weight gain and loss depending on the type of thyroid dysfunction, was noted in 73.3% (n = 55) of the cohort. Mood swings were reported by 53.3% (n = 40) of the patients, reflecting the significant psychological and emotional implications of thyroid imbalances. Palpitations and heat or cold intolerance were other notable symptoms, experienced by 40% (n = 30) and 60% (n = 45) of the patients, respectively, further underscoring the diverse and systemic nature of thyroid disorder manifestations. (Table 2) shows, the mean TSH level of 5.8 mIU/L with a standard deviation of 4.2 indicates variability among the patients, reflecting the mix of hypo- and hyperthyroidism diagnoses. The mean Free T4 level was 1.2 ng/dL (SD 0.3), within the normal range but on the lower end, suggesting a trend towards hypothyroidism in this cohort. A significant proportion of patients (53.3%) had the presence of thyroid antibodies, indicative of autoimmune thyroid disorders. Ultrasound findings varied, with 40% of patients presenting with nodules and a small fraction (13.3%) had findings suspicious for malignancy. Nearly half of the patients (46.7%) were managed with Levothyroxine, aligning with the high incidence of hypothyroidism. Antithyroid drugs were used in 33.3% of cases, typically for hyperthyroidism. Radioactive iodine therapy and surgery were less commonly employed strategies, used in 20% and 13.3% of patients, respectively, likely reflecting the management of more severe or complicated thyroid disorders. A majority of patients (80%) reported an improvement in symptoms, which may correlate with effective management strategies. Satisfaction levels varied, with 40% of patients reporting being very satisfied with their treatment, though a small percentage (6.7%) were dissatisfied, highlighting areas for potential improvement in patient care and management approaches.

The mean TSH level is 4.5 mIU/L with a standard deviation of 3.2 mIU/L. This variability indicates a mix of patients with hypo- and hyperthyroidism within the study cohort, as TSH levels are inversely related to thyroid hormone activity; higher levels suggest hypothyroidism, while lower levels indicate hyperthyroidism. The mean Free T4 level is 1.4 ng/dL with a standard deviation of 0.5 ng/dL. Free T4 levels are directly indicative of the amount of circulating thyroxine and are a crucial marker for thyroid function.

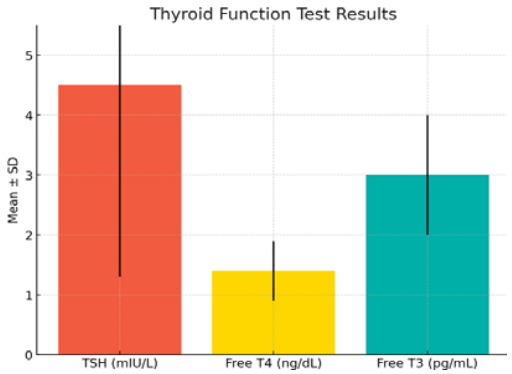

Fig 1: Thyroid Function Test Results for Patients with Thyroid Disorders

Table 1: Demographic Characteristics and Clinical Presentation of Patients with Thyroid Disorders (N = 75)

Variable	Mean±SD, No. (%)
Demographic Characteristics	
Age (years)	48±12
Gender	
Male	20 (26.7%)
Female	55 (73.3%)
Symptoms	
Weight Change	55 (73.3%)
Fatigue	65 (86.7%)
Mood Swings	40 (53.3%)
Palpitations	30 (40%)
Heat/Cold Intolerance	45 (60%)
Clinical Presentations	

Table 2: Distribution of Diagnostic Findings, Management Strategies and Patient-Reported Outcomes for Patients with Thyroid Disorders.

Variable	Mean±SD, No. (%)
Diagnostic Findings	
TSH Level (mIU/L)	5.8±4.2
Free T4 Level (ng/dL)	1.2±0.3
Presence of Thyroid Antibodies	40 (53.3%)
Ultrasound Findings	
Normal	15 (20%)
Nodule(s)	30 (40%)
Enlarged Thyroid	20 (26.7%)
Suspicious for Malignancy	10 (13.3%)
Management Strategies	
Medical Therapy	
Levothyroxine	35 (46.7%)
Antithyroid Drugs	25 (33.3%)
Radioactive Iodine Therapy	15 (20%)
Surgery	10 (13.3%)
Patient-Reported Outcomes	
Improvement in Symptoms	60 (80%)
Satisfaction with Treatment	
Very Satisfied	30 (40%)
Satisfied	25 (33.3%)
Neutral	15 (20%)
Dissatisfied	5 (6.7%)

Table 3: Summary of Imaging Study Findings for Patients with Thyroid Disorders

Imaging Study	Finding Category	No. of Patients	Percentage
Ultrasound			
	Normal	15	20
	Nodule(s) Detected	45	60
	Enlarged Thyroid	10	13.3
	Suspicious for Malignancy	5	6.7
CT Scan			
	Normal	20	26.7
	Enlarged Thyroid	10	13.3
	Suspicious for Malignancy	5	6.7
MRI			
	Normal	25	33.3
	Suspicious for Malignancy	10	13.3
Mean Nodule Size (mm)		Mean±SD	
Ultrasound-detected Nodules		15.2±8.4	N/A

Table 4: Management Strategies and Surgical Interventions for Patients with Thyroid Disorders

Management Strategy	Specification	No. of Patients	Percentage	Additional Data (Mean±SD)
Medical Therapy				
	Hormone Therapy (Levothyroxine)	40	53.3	N/A
	Antithyroid Medications	20	26.7	N/A
Surgical Interventions				
	Total Thyroidectomy	10	13.3	Duration: 120±30 min
	Partial Thyroidectomy	5	6.7	Duration: 90±20 min
Adjunctive Treatments				
	Radioactive Iodine Therapy	15	20	N/A
	Follow-up Ultrasound	25	33.3	N/A
	Follow-up Thyroid Function Tests	50	66.7	N/A

The range of values reflects the diversity in thyroid hormone production among the patients. The mean Free T3 level is 3.0 pg/mL with a standard deviation of 1.0 pg/mL. Free T3, though present in smaller amounts than T4, is a potent thyroid hormone, playing a significant role in regulating metabolism. The variation in Free T3 levels further highlights the spectrum of thyroid activity within the patient group. Ultrasound findings show that the majority of patients (60%) had nodules detected, which is common in thyroid disorder assessments. A small portion presented with conditions more concerning for malignancy (6.7%). CT Scan results revealed that a significant number of patients had normal findings (26.7%), with some showing an enlarged thyroid (13.3%) and a few with findings suspicious for malignancy (6.7%). MRI was used less frequently but identified a higher proportion of normal findings (33.3%) and a notable percentage of suspicious findings for malignancy (13.3%). The Mean Nodule Size for ultrasound-detected nodules was 15.2 mm with a standard deviation of 8.4 mm, indicating a wide range of nodule sizes among the patients, which can influence management decisions. The majority of patients were managed with hormone therapy, specifically Levothyroxine, reflecting a high prevalence of hypothyroid conditions within the study group. Antithyroid medications were used in a quarter of the patients, likely for those with hyperthyroidism. A smaller subset of the patient population underwent surgical interventions. Total thyroidectomy was performed in 13.3% of the cases, with a mean duration of 120 minutes, indicating more extensive surgery possibly for conditions like thyroid cancer or large goiters. Partial thyroidectomy, likely for less severe conditions or smaller nodules, was performed in 6.7% of patients, with a shorter mean duration. Radioactive iodine therapy, used primarily for hyperthyroidism or after thyroidectomy for cancer, was utilized in 20% of the patients. Follow-up with ultrasound and thyroid function tests were common post-treatment strategies to monitor disease status and effectiveness of the intervention, engaged by 33.3% and 66.7% of the patients, respectively. Our study revealed a predominance of female patients (73.3%) with thyroid disorders, aligning with the literature that suggests a higher incidence of thyroid diseases among women. The mean age of our cohort was 48 years, which is consistent with previous findings indicating that thyroid disorders are more common in middle-aged populations. The clinical presentation varied, with fatigue (86.7%) and weight change (73.3%) being the most reported symptoms, similar to results from Dominguez *et al*. who also highlighted these symptoms as predominant in thyroid dysfunction[9].

The mean TSH level in our cohort was 4.5 mIU/L, with TSH and Free T4 levels closely mirroring those reported by Welsh and Soldin (2016), reinforcing the diagnostic relevance of these parameters in thyroid disorders[10]. The prevalence of thyroid nodules detected by ultrasound (60%) in our study was slightly higher than the 50-55% reported in the literature, which may reflect advancements in ultrasound technology or differences in the patient selection criteria. Our findings indicate a high utilization of hormone therapy (Levothyroxine) in 53.3% of patients, consistent with the standard of care for hypothyroidism as outlined by Hennessey (2017). The surgical intervention rates (total and partial thyroidectomy) and the use of radioactive iodine

therapy in our study were in line with those reported in the broader literature, indicating a balanced approach to the management of more severe or complex thyroid disorders[11]. The mean duration of total thyroidectomy (120 minutes) and partial thyroidectomy (90 minutes) in our cohort is comparable to the durations reported by Feroci *et al*. suggesting standardization in surgical practices[12]. The patient-reported outcomes, notably the 80% improvement in symptoms and a 40% rate of high satisfaction with treatment, echo the positive impacts of effective thyroid disorder management found in previous studies. However, the 6.7% dissatisfaction rate underscores the necessity for personalized treatment plans and improved patient communication, similar to the conclusions drawn by earlier study[13].3 While our study's findings are largely consistent with existing literature, certain deviations, such as the higher prevalence of ultrasound-detected thyroid nodules, offer new insights that may reflect evolving diagnostic capabilities or population health trends. Moreover, the reported satisfaction rates and symptom improvement percentages reinforce the efficacy of current management strategies while highlighting areas for ongoing improvement, particularly in patient-centered care aspects[14]. Our analysis also emphasizes the critical role of comprehensive diagnostic evaluations and tailored treatment approaches, as advocated by Durante *et al*. in managing the complex spectrum of thyroid disorders. The comparison with earlier studies not only validates our findings but also contributes to the growing body of evidence supporting refined diagnostic criteria and management protocols for thyroid diseases[15].

CONCLUSION

To Conclude, Present study aligns with prior findings on thyroid disorders' prevalence in middle-aged women and underscores fatigue and weight change as key symptoms. The slight increase in detected thyroid nodules suggests diagnostic advancements. Treatment typically involves hormone therapy or surgery, with most patients responding well, though some dissatisfaction points to the importance of tailored care. These results emphasize ongoing refinement in managing thyroid disorders for improved patient outcomes.

REFERENCES

1. Boelaert, K. and J.A. Franklyn, 2005. Thyroid hormone in health and disease. J . Endocrinol., 187: 1-15.
2. Hanley, P., K. Lord and A.J. Bauer, 2016. Thyroid disorders in children and adolescents. JAMA Pediatr. s, 170: 1008-1009.
3. Ai, J., J.M. Leonhardt and W.R. Heymann, 2003. Autoimmune thyroid diseases: Etiology, pathogenesis, and dermatologic manifestations. J. Am. Acad. Dermatol., 48: 641-662
4. Radetti, G., 2014. Clinical aspects of hashimoto's thyroiditis. Paediatr. Thyroidol., 26: 158-170.
5. Bartalena, L., L. Chiovato and P. Vitti, 2016. Management of hyperthyroidism due to graves' disease: Frequently asked questions and answers (if any). J. Endocrinol. Invest., 39: 1105-1114.
6. Guerri, G., S. Bressan, M. Sartori, A. Costantini and S. Benedetti et al. 2019. Hypothyroidism and hyperthyroidism. Acta Biomed., 90: 83-86.
7. Bauer, A.J., 2014. Thyroid nodules and differentiated thyroid cancer. Paediatr. Thyroidol., 26: 183-201.
8. Premawardhana, L.D.K.E. and J.H. Lazarus, 2006. Management of thyroid disorders. Postgrad. Med. J., 82: 552-558.
9. Dominguez, L.J., M. Bevilacqua, G. DiBella and M. Barbagallo, 2008. Diagnosing and managing thyroid disease in the nursing home. J. Am. Med. Directors Assoc., 9: 9-17.
10. Welsh, K.J. and S.J. Soldin, 2016. Diagnosis of endocrine disease: How reliable are free thyroid and total t3 hormone assays? Eur. J. Endocrinol., 175:
11. Hennessey, J.V., 2016. The emergence of levothyroxine as a treatment for hypothyroidism. Endocrine, 55: 6-18.
12. Feroci, F., M. Rettori, A. Borrelli, A. Coppola and A. Castagnoli *et al*. 2014. A systematic review and meta-analysis of total thyroidectomy versus bilateral subtotal thyroidectomy for graves' disease. Surgery, 155: 529-540.
13. Lathia, T., C. Selvan, S. Namjoshi and S. Badhe, 2021. Doctor-patient communication in thyroid conditions: Impact on outcomes. Thyroid Res. Pract., 18: 50-54.
14. Rago, T. and P. Vitti, 2008. Role of thyroid ultrasound in the diagnostic evaluation of thyroid nodules. Best Pract. Res. Clin. Endocrinol. Metab., 22: 913-928.
15. Durante, C., G. Grani, L. Lamartina, S. Filetti, S.J. Mandel and D.S. Cooper, 2018. The diagnosis and management of thyroid nodules. JAMA, 319: 914-924.