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Characteristics of Thyroid Eye Disease Patients at Wahidin Sudirohusodo Hospital Makassar

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Abstract

Background: Thyroid Eye Disease (TED) is an autoimmune orbital disorder frequently associated with Graves' disease, marked by orbital fat expansion and extraocular muscle swelling that may impair vision and quality of life. **Objective:** To describe the characteristics of TED patients at RSUP Wahidin Sudirohusodo Makassar based on age, gender, clinical manifestations, management, and smoking history. **Methods:** A descriptive study of 55 TED patients recorded at RSUP Wahidin Sudirohusodo Makassar. **Results:** Most patients were aged 20–44 years (60%), followed by 45–64 years (34.55%) and 13–19 years (5.45%), with no cases above 65 years. Females predominated (61.82%). The most common symptom was proptosis (100%), followed by excessive tearing (49.09%), red eyes (27.27%), refractive errors (23.64%), diplopia (10.91%), pain during eye movement (7.27%), and photophobia (7.27%). The main treatment was intravenous methylprednisolone plus thiamazole (47.27%), followed by intravenous methylprednisolone alone (18.18%), thyrozol (18.18%), and propranolol (9.09%). One patient (1.82%) underwent orbital decompression. Active smoking was reported in 32.73% of patients. **Conclusion:** TED patients were predominantly females aged 20–44 years, with proptosis as the leading manifestation. The most common management was intravenous methylprednisolone combined with thiamazole. Smoking may worsen disease severity.

Keywords: *Thyroid Eye Disease (TED), patient characteristics, management*.

Introduction

Thyroid Eye Disease (TED) is a complex inflammatory orbital disorder associated with autoimmune thyroid disease that can threaten vision, weaken patients, and reduce quality of life. TED is also known as Graves' ophthalmopathy, named after Robert J. Graves, an Irish physician who first described thyrotoxicosis in a woman with goiter, rapid heartbeat, and exophthalmos. Graves' disease is characterized by a triad: hyperthyroidism, infiltrative ophthalmopathy, and infiltrative dermopathy [1,2].

Thyroid eye disease is a complex autoimmune disease that can cause significant ocular symptoms, facial changes, vision loss, and decreased quality of life. The disease affects 16 per 100,000 women and 2.9 per 100,000 men . Female gender, age, smoking, and radioiodine therapy (RAI) have been linked to increased TED risk [3].

In Indonesia, the specific prevalence of Graves' disease is unknown. Among all hyperthyroidism patients, approximately 60-80% have Graves' disease. The 2013 Indonesian Basic Health Research (Riskesdas) by the Ministry of Health reported hyperthyroidism prevalence of 0.4%, with 0.6% in females and 0.2% in males. TED has higher prevalence in females than males. Ophthalmopathy is the most common

extrathyroidal disorder in Graves' disease, ranging from mild (40-50%) to moderate-severe (3-5%) cases [4,5].

TED can cause pain, dry eyes, increased tearing, diplopia, eyelid retraction, exophthalmos, and in more severe cases, vision loss, leading to significant functional and psychological disturbances and reduced quality of life [6,7].

Several factors are identified to increase TED risk, including age, gender (females have higher risk than males), smoking, radioiodine therapy, and oxidative stress [8,9].

The pathophysiology of this disease is not fully understood due to its complexity, and the mechanisms triggering autoimmune reactions likely involve T-helper cell disorders causing anti-TSH autoantibody formation. T cells also play a role in the characteristic infiltrative ophthalmopathy of Graves' disease [10,11].

Clinical assessment of TED typically involves measuring disease activity and severity. The disease usually begins with an acute inflammatory or active phase, averaging 18 months, though this period can vary significantly. Traditionally, steroid therapy and/or radiation therapy are often used to reduce inflammation during the active phase. Naturally, inflammation decreases over time as patients enter a more chronic or stable phase marked by fibrosis, although orbital congestion and other factors can cause transitions between "phases" [3].

Available therapies for TED patients include intravenous glucocorticoids (IVGC), considered first-line therapy for moderate-to-severe TED, usually given at high doses. The treatment goal is to achieve normal thyroid function. Other options to achieve normal thyroid function include radioactive iodine surgery and thyroidectomy. For individuals with mild TED, radioactive iodine may be considered initial treatment. However, this should be done concurrently with glucocorticoid use, especially if they smoke or have high TSHR antibody titers. Thyroidectomy is surgery to remove half (lobectomy) or all (total thyroidectomy) of the thyroid gland [9,12].

Although TED prevalence and risk factors have been extensively studied in other countries, specific data regarding clinical and epidemiological characteristics of TED patients in Indonesia, particularly in eastern regions like Makassar, remain very limited. This research holds high urgency as its findings are expected to provide deeper insights into TED patient profiles at RSUP Wahidin Sudirohusodo Makassar. Thus, it can help formulate more targeted prevention, early diagnosis, and management strategies according to local population characteristics. Additionally, this research is expected to contribute to enriching TED literature in Indonesia and open opportunities for further research on unique factors that may influence TED prevalence or severity in this population. Based on the above explanation, the researchers are interested in determining the characteristics of TED patients at RSUP Wahidin Sudirohusodo Makassar.

Materials and Methods

Study Design

This study used a descriptive design with a cross-sectional approach to determine TED patient characteristics. This approach was conducted to obtain a description or objective condition at a single time point. The study was conducted at Wahidin Sudirohusodo Hospital, Makassar in September–October 2024 using secondary data from patient medical records. The research focus was describing characteristics based on variables: age, gender, clinical manifestations, management, and smoking history.

Sample

The research population included all TED patients at Wahidin Sudirohusodo Hospital, Makassar during January 2020 – August 2024.

Samples were selected using purposive sampling, with 55 patients calculated using Slovin's formula to obtain a representative sample size. Inclusion criteria were medical records complete with age, gender, clinical manifestations, management, and smoking history. Exclusion criteria were TED patients with other diseases like allergies or fever.

Data Collection Techniques

Data were collected after obtaining official permission from Wahidin Sudirohusodo Hospital, Makassar. Data sources used were medical records of patients who had undergone treatment at the hospital during the research period. Collected data included age, gender, clinical manifestations, management, and smoking history. Data collection involved carefully reviewing medical records of patients meeting inclusion and exclusion criteria.

Data Analysis Techniques

Analysis was conducted descriptively to describe TED patient characteristics. Data obtained from medical records were processed using Microsoft Excel software to calculate frequencies and percentages of each research variable. Analysis results were then presented in frequency distribution and percentage tables to facilitate data interpretation.

Ethical Consideration

This study received approval from the Research Ethics Committee (KEP) of Universitas Muslim Indonesia with ethical recommendations valid until July 29, 2025. The ethical approval letter has reference number 327/A.1/KEP-UMI/VII/2024. Research implementation adhered to research ethics principles, including maintaining patient data confidentiality and ensuring data use solely for research purposes per granted approval.

Result

This study used secondary data from medical records of TED patients registered at Wahidin Sudirohusodo Hospital, Makassar who met inclusion and exclusion criteria. The research population and sample for TED were taken from January 2020 - August 2024 period. Results are presented in tables with explanations as follows:

Table 1. Characteristics of Tonsillopharyngitis Patients

Variable	Frequency	Percentage (%)
Age		
Adolescents (13-19 years)	3	5.45
Young Adults (20-44 years)	33	60.00
Older Adults (45-64 years)	19	34.55
Elderly (>65 years)	0	0.00
Gender		
Male	21	38.18
Female	34	61.82
Clinical Manifestations		
Proptosis	55	100
Diplopia	6	10.91
Blurred Vision	13	23.64
Red Eyes	15	27.27
Excessive Tearing	27	49.09
Pain on Eye Movement	4	7.27
Photophobia	4	7.27
Medication Group		
Antithyroid		
Thiamazole:		
Thyrozol	10	18.18
Propranolol	5	9.09
Propylthiouracil	0	0.00
Corticosteroids		
Oral Prednisolone	0	0.00
IV Methylprednisolone	10	18.18
Combination		
IV Methylprednisolone + Thiamazole	26	47.27
IV Methylprednisolone + Propylthiouracil	3	5.45
Smoking History		
Active Smokers	18	32.73
Passive Smokers	n/a	n/a
Total	**55**	**100**

Source: *Secondary Data, 2024*

Table 1 describes characteristics of tonsillopharyngitis patients based on age, gender, clinical manifestations, management, and smoking history. This data includes 55 TED patients treated at Wahidin Sudirohusodo Hospital, Makassar. The majority of patients (60%) were in the productive age range (20–44 years), indicating TED can significantly impact this age group. By gender, females were more frequently diagnosed (34 patients, 61.82%) compared to males (21 patients, 38.18%). This reflects that females may have higher TED risk, as supported by previous research. This finding

highlights the need for early detection and targeted prevention strategies, especially among individuals in the productive age group and women.

Regarding clinical manifestations, all patients (100%) experienced proptosis, the primary TED symptom. Other symptoms included excessive tearing in 27 patients (49.09%), red eyes in 15 patients (27.27%), refractive errors in 13 patients (23.64%), diplopia in 6 patients (10.91%), pain on eye movement in 4 patients (7.27%), and photophobia in 4 patients (7.27%). These symptoms show TED's clinical variations that can significantly impact patient quality of life.

For management, 26 patients (47.27%) received combination therapy of intravenous methylprednisolone and thiamazole, a common approach to control inflammation and thyroid dysfunction. Ten patients (18.18%) received only intravenous methylprednisolone therapy, while one patient (1.82%) required invasive orbital decompression, indicating more severe cases. However, 18 patients (32.73%) received non-specific therapy or had incomplete treatment data in reports.

Smoking history was a focus, with 18 patients (32.73%) identified as active smokers. Smoking is known as a significant risk factor that can worsen TED manifestations. Unfortunately, data on passive smokers were unavailable, preventing more detailed conclusions about secondhand smoke exposure relationships with disease severity.

Overall, this patient profile provides important insights into age distribution, gender, clinical manifestations, management, and risk factors' role in TED, which can serve as a basis for more effective future management strategies.

Discussion

Age of TED Patients

Research results show most TED patients were young adults (20-44 years) at 60%. This aligns with Fitrada et al.'s (2019) research on clinical characteristics in thyroid-associated ophthalmopathy (TAO) patients. Their results showed 93.5% adults experienced TED, occurring most commonly in the 18-60 age group. Another study by Munandar et al. (2022) showed TED more frequently appears between ages 30-60 [13,14].

TED is an autoimmune disease where the immune system attacks tissues around the eyes, especially in individuals with thyroid disorders. The immune system becomes more active and can be triggered with increasing age. TED typically attacks adults but can occur at any age. Factors potentially contributing to higher incidence in this group include smoking, stress, and infections [13,15].

Gender of TED Patients

Results show 61.82% of diagnosed TED patients were female and 38.18% male. This aligns with Fitrada et al.'s (2019) research on clinical characteristics in TAO patients, showing 72.8% of TED patients were female. Andressa et al.'s (2019) research also showed females dominate TED over males with 70% results. Contributing factors may include estrogen dominance in females acting as autoimmune reaction triggers and genetic factors making them more susceptible to the disease [13,16,17].

Clinical Manifestations of TED Patients

Results show 100% of TED patients experienced proptosis. This aligns with Szelog et al.'s (2022) research on TED, showing 60% of subjects experienced proptosis symptoms. Another study by Pramita et al. (2019) on proptosis patient characteristics showed 99% experienced eye protrusion (proptosis) [18,19].

TED is chronic inflammation mediated by the immune system in the eye cavity. This disease is the most common cause of unilateral and bilateral proptosis in adults. Proptosis is a clinical manifestation of pathology causing

eyeball protrusion anteriorly away from the orbital rim. Generally, proptosis can be caused by tumors, vascular disorders, inflammatory processes, or trauma. Other common complaints include red eyes, excessive tearing, photophobia, pain on eye movement, and vision disturbances like blurred and double vision [19,20].

Management of TED Patients

Results show 70.91% of TED patients received methylprednisolone IV from the corticosteroid group. This aligns with Subekti et al. (2019) showing intravenous glucocorticoids demonstrate 70-80% effectiveness, while oral administration only 50%. Additionally, intravenous glucocorticoids show better tolerance than oral. Methylprednisolone was given at 500 mg/day for 3 consecutive days, repeated weekly for 4 weeks. However, this contradicts Diniz et al.'s (2021) research stating teprotumumab treatment in TED patients produced significant improvements in proptosis and clinical activity scores, with over 70% achieving >2mm proptosis reduction [21–23].

TED treatment depends on disease activity and severity, often requiring multidisciplinary approaches. For mild TED, treatment includes optimizing ocular surface with lubricants, minimizing modifiable risk factors like smoking, and controlling thyroid hormone levels. Selenium, an antioxidant, also benefits mild disease patients. Smoking is a modifiable risk factor known to increase TED risk and severity. The causal relationship between smoking and TED likely involves gene expression changes, cytokine production, tissue hypoxia, and other unknown components. Consistent with our hypothesis, smokers showed poorer response to teprotumumab treatment in proptosis reduction [2,24–27].

Tobacco compounds in cigarettes are suspected to act in several ways. Soft tissue orbital changes are one primary mechanism by which smoking can affect TED development. One tobacco component affecting thyroid gland function is cyanide, which converts to thiocyanate in the body. Thiocyanate is known to interfere with thyroid function in three ways: inhibiting iodine absorption into the thyroid gland, reducing T4 and T3 hormone production, inhibiting hormone synthesis by disrupting processes in the thyroid gland, and increasing iodine excretion from kidneys, increasing thyroid inflammation risk [2,25,28].

Conclusion

This study concludes that TED patients at Wahidin Sudirohusodo Hospital, Makassar were predominantly young adults (20-44 years), with most patients being female. Common clinical manifestations included proptosis, diplopia, blurred vision, red eyes, excessive tearing, pain on eye movement, and photophobia. The most frequently used treatment was corticosteroid and antithyroid combination (intravenous methylprednisolone + thiamazole). Smoking habits were known to accelerate disease progression and worsen symptoms. Recommendations include enhancing smoking cessation education, conducting further research on disease management and risk factors, and improving medical record documentation to support more comprehensive data analysis.

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