



CLINICAL FEATURES AND OUTCOME OF THYROTOXICOSIS IN A PHILIPPINE TERTIARY PEDIATRIC HOSPITAL

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Introduction

Thyrotoxicosis is a state of excess circulating thyroid hormone originating from any cause. It is a rare but potentially serious disorder in childhood that if uncontrolled and unrecognized, can lead to a wide range of complications affecting growth and development (16). Few studies indicate the incidence specific in the pediatric population. The incidence is 1/100,000/year, with the incidence rising from young children to adolescent (1). However, in the Philippines, data on thyrotoxicosis in childhood are still not established. In the disease registry of the Philippine Pediatric Society, there are only 107 cases of thyrotoxicosis and 59 cases of thyroid crisis or storm reported.

Objective

This research determined the clinical features and outcome of thyrotoxicosis among children ages less than and equal to 19 years old admitted at a pediatric tertiary hospital.

Design

This is a retrospective cross-sectional study. There were 30 patients who were included in the study.

Patients / Participants

Records of patients ages less than 19 years admitted at NCH from January 1, 2006 to December 31, 2020 with a final diagnosis of Thyrotoxicosis, Hyperthyroidism, Grave's disease, Hashimoto's thyroiditis, and Thyroid storm were retrospectively reviewed. This study used total enumeration.

Main Outcome Measures

Clinical features and outcome of these cases were determined using descriptive statistics.

Results

Majority of patients with thyrotoxicosis were female, with mean age of 14.3±3.44. In this study, tachycardia was the most common initial presenting signs and symptoms, followed by vomiting. Infection remains the prevalent precipitating factor, with laboratory findings of low TSH at ≤2.5th percentile and elevated fT3 and fT4 for age at ≥95th percentile. Majority of these patients were sent home alive.

SPECIFIC OBJECTIVE #1: TO DETERMINE THE CLINICAL PROFILE OF CHILDREN WITH THYROTOXICOSIS ACCORDING TO: A. INITIAL PRESENTING SIGNS AND SYMPTOMS

N = 30		n (%)
Cardiovascular Dysfunction	Total	24
	Tachycardia	23 (76.7%)
	Atrial Fibrillation	1 (3.3%)
Gastrointestinal and Hepatic Dysfunction	Total	21
	Nausea	2 (6.7%)
	Vomiting	13 (43.3%)
	Diarrhea	6 (20.0%)
Fever (T≥38C)		16 (53.3%)
Heart failure	Total	11
	Pulmonary Edema	1 (3.3%)
	Moist Rales	3 (10.0%)
	Cardiogenic Shock	1 (3.3%)
	NYHA Class IV or ≥ Class III Killip	6 (20.0%)
Central Nervous System Effects	Total	8
	Restlessness	5 (16.7%)
	Delirium	1 (3.3%)
	Mental aberration or psychosis	1 (3.3%)
	Somnolence or lethargy	1 (3.3%)

SPECIFIC OBJECTIVE #1: TO DETERMINE THE CLINICAL PROFILE OF CHILDREN WITH THYROTOXICOSIS ACCORDING TO: D. PRECIPITATING EVENT

N = 30		n (%)
Infection	Total	23
	Pneumonia	12 (40.0%)
	UTI	3 (10.0%)
	Acute gastroenteritis	3 (10.0%)
	Acute tonsillopharyngitis	2 (6.7%)
	Carbuncle	1 (3.3%)
	Systemic viral illness	1 (3.3%)
	Infective endocarditis	1 (3.3%)
Withdrawal of anti-thyroid drugs		5 (16.7%)
Emotional Stress		3 (10.0%)
Surgical		1 (3.3%)

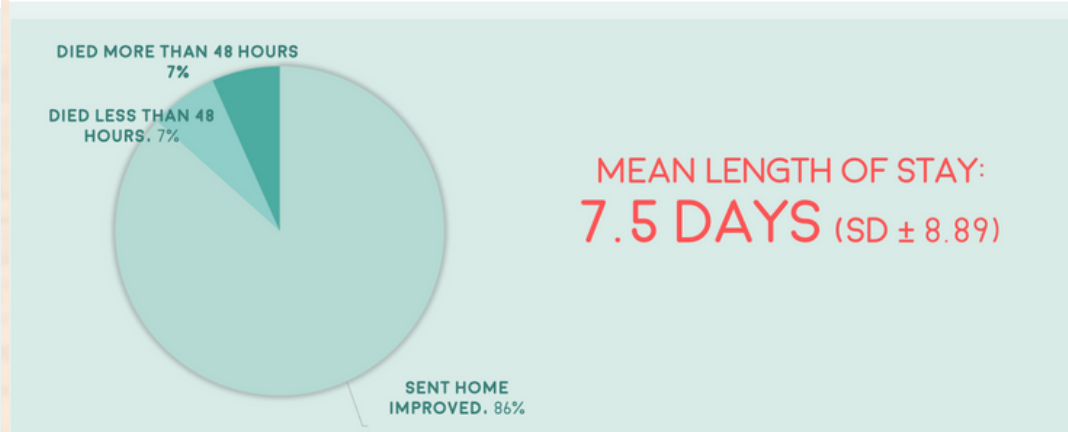
SPECIFIC OBJECTIVE #1: TO DETERMINE THE CLINICAL PROFILE OF CHILDREN WITH THYROTOXICOSIS ACCORDING TO: B. NUTRITIONAL STATUS. C. COMORBIDITIES

N = 30		n (%)
Nutrition Status	Under height/ stunting (<-2SD)	9 (30.0%)
	Normal (-2SD to +2SD)	21 (70.0%)
	Above average/ tall (≥+2SD)	0 (0.0%)
Comorbidities	Rheumatic heart disease	5 (16.7%)
	Other Comorbidities:	3 (10.0%)
	Systemic Lupus Erythematosus	1 (3.3%)
	Complete heart block	1 (3.3%)
	Mitral valve prolapse	1 (3.3%)
	None	22 (73.3%)

SPECIFIC OBJECTIVE #2: TO DETERMINE THE LABORATORY FEATURES OF CHILDREN WITH THYROTOXICOSIS

N = 30		n (%)
TSH Percentile	2.5	30 (100.0%)
	2.5	5 (16.7%)
fT3 Percentile	10	3 (10.0%)
	90	1 (3.3%)
	97.5	21 (70.0%)
fT4 Percentile	2.5	6 (20.0%)
	97.5	24 (80.0%)

SPECIFIC OBJECTIVE #3: TO DETERMINE THE OUTCOME OF CHILDREN WITH THYROTOXICOSIS



Conclusion and Recommendations

The associated symptoms do not always suggest thyroid disease, more often than not, overlap with other disease entities and patients can be ill for a long time before the diagnosis is made. Thyroid function investigation should then be considered in patient with abnormal findings, such as tachycardia and vomiting. Physicians should not delay all the necessary treatment when there is a clinical suspicion. Future follow-up studies could also include the treatment done to these cases, in order to aid in future guidelines as treatment is still controversial in children and adolescents.

Keywords: Thyrotoxicosis, Hyperthyroidism, Grave's disease, Hashimoto's thyroiditis, Thyroid storm

References

1. Birrell G, Cheetham T. Juvenile thyrotoxicosis; can we do better? Arch Dis Child. 2004 Aug 1;89(8):745-50.
2. Zimmerman D, Lteif AN. Thyrotoxicosis in children. Endocrinol Metab Clin North Am. 1998 Mar 1;27(1):109-26.
3. Williamson S, Greene SA. Incidence of thyrotoxicosis in childhood: a national population based study in the UK and Ireland. Clin Endocrinol (Oxf). 2010;72(3):358-63.
4. Kourime M, McGowan S, Towati MA, Ahmed SF, Stewart G, Williamson S, et al. Long-term outcome of thyrotoxicosis in childhood and adolescence in the west of Scotland: the case for long-term antithyroid treatment and the importance of initial counselling. Arch Dis Child. 2018 Jul 1;103(7):637-42.
5. Lavard L, Ranløv I, Perrild H, Andersen O, Jacobsen BB. Incidence of juvenile thyrotoxicosis in Denmark, 1982-1988. A nationwide study. Eur J Endocrinol. 1994 Jun;130(6):565-8.
6. Wong GW, Cheng PS. Increasing incidence of childhood Graves' disease in Hong Kong: a follow-up study. Clin Endocrinol (Oxf). 2001 Apr;54(4):547-50.
7. Akamizu T. Thyroid Storm: A Japanese Perspective. Thyroid Off J Am Thyroid Assoc. 2018 Jan 1;28(1):32-40.
8. Angell TE, Lechner MG, Nguyen CT, Salvato VL, Nicoloff JT, LoPresti JS. Clinical Features and Hospital Outcomes in Thyroid Storm: A Retrospective Cohort Study. J Clin Endocrinol Metab. 2015 Feb 1;100(2):451-9.
9. Idrose AM. Acute and emergency care for thyrotoxicosis and thyroid storm. Acute Med Surg. 2015 May 12;2(3):147-57.
10. Carlos-Raboca J, Jimeno CA, Kho SA, Andag-Silva AA, Gabriel V, Jasul J, Nemencio A, Nicodemus J, et al. The Philippine Thyroid Diseases Study (PhilTiDeS 1): Prevalence of Thyroid Disorders Among Adults in the Philippines. J ASEAN Fed Endocr Soc. 2014 May 21;27(1):27.
11. Lim-Abraham A, Germar H, de Guzman A, Odvina C, Manipol V. Thyroid storm: A review of twenty-seven episodes. Acta Med Philipp. 1984;20(2):48-53.
12. Torres J, Vinas-Alcantara E, Mercado-Asis L, San Luis T, Dela Cruz M. Clinical profile of patients with thyroid storm. Philipp J Intern Med. 1998;36(6):215-20.
13. Cauton-Valera R, Lim-Abraham MA. Thyroid storm revisited: A clinical profile of patients with thyroid storm at the University of the Philippines-Philippine General Hospital (1996-2000). Philipp J Intern Med. 2003;41(2):75-82.
14. Salud JLMF, Estrada SC. A clinical profile of pediatric patients admitted for thyrotoxicosis in a tertiary hospital using the 1992 Burch and Wartofsky criteria. Int J Pediatr Endocrinol. 2013;2013(Suppl 1):P152.
15. Burch HB, Wartofsky L. Life-threatening thyrotoxicosis. Thyroid storm. Endocrinol Metab Clin North Am. 1993 Jun;22(2):263-77.
16. Srinivasan S, Misra M. Hyperthyroidism in Children. Pediatr Rev. 2015 Jun 1;36(6):239-48.
17. Azizi F, Amouzegar A. Management of thyrotoxicosis in children and adolescents: 35 years' experience in 304 patients. J Pediatr Endocrinol Metab. 2018 Jan 26;31(2):159-65.
18. Bauer AJ. Approach to the pediatric patient with Graves' disease: when is definitive therapy warranted? J Clin Endocrinol Metab. 2011 Mar;96(3):580-8.
19. Singh A, Purani C, Mandal A, Mehariya KM, Das RR. Prevalence of Thyroid Disorders in Children at a Tertiary Care Hospital in Western India. J Clin Diagn Res JCDR. 2016 Feb;10(2):SC01-4.
20. Kapelari K, Kirchlechner C, Högl W, Schweitzer K, Virgolini I, Moncayo R. Pediatric reference intervals for thyroid hormone levels from birth to adulthood: a retrospective study. BMC Endocr Disord. 2008;8:15.
21. Shim S, Ryu HS, Oh HJ, Kim Y. Thyrotoxic Vomiting: A Case Report and Possible Mechanisms. J Neurogastroenterol Motil. 2010 Aug 21;16(4):428-32.