



PREVALENCE OF HYPOTHYROIDISM IN ADOLESCENT SCHOOL GIRLS AGED 13-18 YEARS IN KOLKATA

Ravi Kant Saraogi*

Consultant Endocrinologist, BM Birla Heart Research Centre, Kolkata.
*Corresponding Author

Shweta Saraogi

General Physician, ESI hospital, Maniktala, Kolkata.

Soumik Goswami

Tutor, Department of Endocrinology, Nilratan Sircar Medical College, Kolkata.

ABSTRACT

Objective: There is a paucity of data on the prevalence of hypothyroidism in the Indian pediatric population. The present pilot study attempts to estimate the prevalence of hypothyroidism in adolescent school girls aged 13-18 years in Kolkata.

Methods: 150 participants were screened for hypothyroidism with serum Thyroid stimulating hormone (TSH) and clinically examined for the presence of goitre.

Results: Prevalence of hypothyroidism was 7.33% (11/150), of newly diagnosed hypothyroidism was 6.66% (10/150) and only 9% (1/11) of those with hypothyroidism had been previously diagnosed. Prevalence of goitre was 4% (6/150) overall and in those with raised TSH 45.45% (5/11 patients). Family history of hypothyroidism was present in 9% (1/11) of girls with hypothyroidism and 10.07% (14/139) of euthyroid girls.

Conclusion: The prevalence of hypothyroidism is high, affecting approximately 1 in 14 adolescent school girls aged 13-18 years in Kolkata and more than ninety percent were previously undetected.

KEYWORDS : Hypothyroidism, Goitre.

INTRODUCTION:

An estimated 42 million Indians are suffering from thyroid disorders. [1] Hypothyroidism is the commonest thyroid disorder in India, affecting one in ten adults in most studies. A recently published study conducted in Kolkata among 148 voluntary participants (students, parents, and teachers of a girls' school in central Kolkata) by one of the authors revealed 17.5% of participants to be newly diagnosed with hypothyroidism with 5% of them having a TSH > 10 mU/L. [2]

There is a paucity of data on the prevalence of hypothyroidism in the pediatric population in India. A mini review published in 2012 states that the prevalence of subclinical hypothyroidism in the pediatric population is less than 2% with the caveat that only a limited number of studies have addressed this issue. [3]

AIMS AND OBJECTIVES:

Hypothyroidism is believed to be an increasing health problem in India but there is a paucity of data on its prevalence in the pediatric population. The present pilot study is an attempt to estimate the prevalence of hypothyroidism in adolescent school girls aged 13-18 years in two government sponsored schools in Kolkata.

MATERIALS AND METHODS:

Study design and enrollment criteria

This was a cross-sectional study conducted at two girls' school of Kolkata as part of a 'thyroid awareness and detection camp' in association with Lions Club of Calcutta. 150 students from class VIII - class X participated in the study. A written informed consent was taken from parents of enrolled girls by the school authorities before the study entry. The students were also explained about the blood sample collection procedure.

Primary outcome variable of the study was the prevalence of hypothyroidism assessed by measurement of serum TSH. Secondary outcome measures were the prevalence of: i) known and undetected hypothyroidism, and ii) association with goitre and family history of thyroid disease in first degree relatives.

STUDY PROCEDURE

Participants were evaluated by a detailed history and clinical examination for evaluation of thyroid disease and data entered into a proforma designed for the same, as well as with laboratory

investigations. Goitre grading was done by a single Endocrinologist based on the WHO goiter grading into 4 grades (Ia, Ib, II & III). A certified laboratory performed serum TSH assay by sandwich chemiluminescence using Advia Centaur automated immunoassay analyzer. Normal TSH range for assay was 0.3-5.5 mU/L.

OBSERVATIONS AND RESULTS:

One hundred and fifty five (155) participants were initially enrolled but out of them five participants were excluded as they refused to provide a blood sample. Samples from 150 girl students were finally analyzed. The mean age of the participants was 16 years and ranged from 13 to 18 years in the overall study population. Mean BMI was 18.5 and ranged from 14.5-28.5 kg/m².

Some of the important findings were:

- Overall prevalence of hypothyroidism was 7.33% (11/150) in adolescent girls aged 13-18 years.
- Prevalence of newly diagnosed hypothyroidism was 6.66% (10/150).
- Prevalence of known thyroid disease was 0.66% (1/150).
- Overall prevalence of goitre was 4% (6/150) of which 50% had grade Ia goitre and 50% had grade Ib goitre.
- Prevalence of goitre in those with raised TSH was 45.45% (5/11 patients).
- Positive family history of hypothyroidism was present in 9% (1/11) of girls with newly detected hypothyroidism and 10.07% (14/139) of girls with normal thyroid function.

DISCUSSION:

In the present pilot study, we estimated the prevalence of hypothyroidism in adolescent school girls aged 13-18 years in two government sponsored schools in Kolkata and it was found to affect 7.33% (11/150) of the study population. The fact that 1 in 14 adolescent school girls had hypothyroidism indicates the enormity of the problem.

In a retrospective study, out of 600 subjects of both children and adolescents studied, the thyroid dysfunction was found to be 10.2 %. The prevalence of thyroid dysfunction was found to be higher in female population (12%) as compared to males (7.4%) in children and adolescent's groups (12 % vs 7.4% and 10% vs 9.4% respectively). [4] The results were in accordance with a previous study where the prevalence was 9.18%. [5]

In a population based study from India, 12% of children aged 5-16 years were found to have thyroid dysfunction in which TSH levels were above the reference range.[6] However, the prevalence of thyroid dysfunction in children and adolescents is lower than adult population where the prevalence was found to be 19.6%.[7]

A recent study conducted in eight cities of India revealed that the prevalence of hypothyroidism in the adult population was 10.95% of which 3.47% were previously undetected and 7.48% were self-reported cases.[8]

Overall prevalence of goitre in our study was 4% (6/150) of which 50% was grade Ia goitre and 50% grade Ib goitre. Our study had higher prevalence of goitre in children with raised TSH [45.45% (5/11)] suggesting that it could be a clinical marker for screening for hypothyroidism. The absence of a significant difference in having a positive family history of thyroid disease in those with hypothyroidism compared to those without suggests that this parameter would not serve a good purpose as a screening tool.

Limitations of this study were that spot free T4 or Total T4 and T3 estimation could not be done because of the cost involved. However, the girls with raised TSH were asked to follow up with Free T4 and TSH.

CONCLUSIONS:

In the present study, the prevalence of hypothyroidism was high (7.33%) affecting approximately 1 in 14 adolescent school girls aged 13-18 years in Kolkata with more than ninety percent of them being previously undetected.

ACKNOWLEDGEMENTS

Authors would like to thank Members of Lions Club of Calcutta, Kankurgachhi and Principal and staff of National Hindi High School and New National High School for their support and encouragement to conduct this study.

Funding: No funding sources

Conflict of interest: None declared.

REFERENCES:

1. Vahab Fatourehchi, Subclinical Hypothyroidism: An 2009;84(1):65-71.
2. Soumik Goswami, Uttio Gupta, Nilanjan Sengupta, Subhankar Chowdhury, Pranab Kumar Sahana, Varun Sharma. Prevalence of hypothyroidism in Kolkata: An epidemiological pilot study. Indian Journal of Basic and Applied Medical Research; March 2016; Vol.-5, Issue- 2, P.370-373.
3. Subclinical hypothyroidism in children. Seshadri KG. Indian J Endocrinol Metab. 2012 Dec;16(Suppl 2):S156-8. doi:10.4103/2230-8210.104028.
4. Rao PTS, Subrahmanyam K, Prasad DKV. Prevalence of subclinical hypothyroidism in children and adolescents of northern Andhra Pradesh population and its association with hyperlipidemia. Int J Res Med Sci 2017;5:5168-74.
5. Lakshminarayana GR, Sheetal LG, Sadanandan NP, Mundekkat P. Thyroid dysfunction in children and adolescence: Experience of a tertiary care centre in Kerala. Pediatr Rev: Int J Pediatr Res. 2016;3(1):3-8.
6. Marwaha RK, Tandon N, Desai AK, Kanwar R, Agarwal R, Sastry A, et al. Reference range of thyroid hormones in healthy school-age children: Country-wide data from India. Clin Biochem. 2010;43(1-2):51-6.
7. Usha MV, Sundaram KR, Unnikrishnan AG, Jayakumar RV, Nair V, Kumar H. High prevalence of undetected thyroid disorders in an iodine sufficient adult south Indian population. J Indian Med Assoc. 2009;107(2):72-7.
8. Ambika Gopalakrishnan Unnikrishnan, Sanjay Kalra, Rakesh Kumar Sahay, Ganapathi Bantwal, Mathew John, and Neeraj Tewari. Prevalence of hypothyroidism in adults: An epidemiological study in eight cities of India. Indian J Endocrinol Metab. 2013 Jul-Aug;17(4):647-652.