

Original Research Article

Assessment of goitre among primary school children in district Chamba, Himachal Pradesh, India

Arvind Kumar Dhiman¹, Sumita Kumari Sandhu^{1*}, Vijay Kumar Yadav², Ishan Arora¹

¹Department of Community Medicine, ²Department of Paediatrics, Pt. Jawahar Lal Nehru Government Medical College Chamba, Himachal Pradesh, India

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***Correspondence:**

Dr. Sumita Kumari Sandhu,

E-mail: docsumita_4891@rediffmail.com

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ABSTRACT

Background: Goiter is one of the most visible manifestations of iodine deficiency disorders (IDD) that is caused due to overstimulation of thyroid as an adaptation to Iodine deficiency. IDD is among the major public health threats and important micronutrient deficiencies in developing countries.

Methods: This cross-sectional study was conducted among 6-12 years school children in district Chamba of Himachal Pradesh from February to June 2019. The sample size of 336 was calculated and a total of 504 children from government schools were enrolled in the study. The assessment of goitre was done clinically by inspection and palpation of thyroid gland.

Results: In this study, 504 school aged children of 6-12 yrs from district Chamba with mean age of 9 ± 1.86 years were included. The prevalence of total goitre rate was 16% with mean age of 8.75 ± 1.37 years. The highest prevalence (%) was observed in age of 10 years (28.4%) followed by 8 years and 9 years (25.9 % and 23.5% respectively).

Conclusions: This study showed mild goitre prevalence in school aged children of 6-12 years in district Chamba of Himachal Pradesh. There is dire need of periodic survey to assess the magnitude of IDD in future.

Keywords: Children, Iodized salt, Goitre

INTRODUCTION

Iodine is an essential element required for synthesis of thyroid hormones T4 and T3. For normal thyroid function and development. Insufficient intake of iodine results in inadequate production of thyroid hormones collectively termed as Iodine deficiency disorders.¹

Globally 1.88 billion people are at risk of Iodine deficiency. About 241 million school children (6-12 years old) have reportedly poor iodine intake of which nearly 76 million live-in south-east Asia. In India most recent survey show that 333 districts are endemic for prevalence of IDDs.²

Goitre is one of the most visible manifestations of IDD that is caused due to overstimulation of thyroid as an adaptation to Iodine deficiency activities.³ Himachal Pradesh (HP) in India is a known endemic to Iodine deficiency.⁴ A significant progress has been made in the control of IDD through the supply of iodized salt. However, the recent studies conducted on school age children have revealed that total goitre rate in many districts are still in the range of 5-20% indicating that the population continues to suffer from chronic iodine insufficiency.⁵

Since district Chamba of Himachal Pradesh comes under Himalayan goiter belt so it is possibility that water and soil may contain negligible iodine.⁶ More over the faulty

salt storage and cooking practices can contribute for iodine deficiency and development of goitre. Keeping the above factors in mind, the present study was conducted to assess the Iodine deficiency associated goitre in district Chamba of Himachal Pradesh.

METHODS

This was a cross sectional study conducted at government primary schools in district Chamba (HP) from February to June 2019.

Sample size

The sample size was estimated by taking the magnitude of iodine deficiency disorder in school aged children is 30% with confidence interval of 95% and marginal error of 5% which resulted in a sample size of 336. Total 504 school children of age group 6-12 years were enrolled in the study. All the children were taken from Government Primary schools in the age group of 6-12 yrs from both Urban and rural areas.

Sampling

Multistage cluster sampling methodology was adopted for selecting the study population. A list of all schools in Chamba town as well as rural area adjacent to Chamba town was procured and cumulative population was calculated. Total 5 schools in Chamba town and 10 schools in the adjacent rural area of Chamba town and all children were included in the survey.

Assessment tools

The clinical examination of all the children was done by the trained medical professionals and standard techniques were used to inspect and palpation. In order to minimize the misclassification of Goitre among children, repeated training and expert opinion was taken by the pediatrician on pictures and videos made on children while deglutition. Goitre was classified as per WHO grading system and sum of grade 1 and 2 was taken as total goitre rate (TGR). Consents were taken from the school authorities of Chamba, principals of each school surveyed before conducting the study.

WHO grading of goitre

Grade 0: Goitre is neither palpable nor visible even when the neck is extended.

Grade 1: Goitre that is palpable but not visible (1A: goitre detected on palpation, 1B: goitre palpable and visible when neck is extended).

Grade 2: Goitre visible when neck held in normal position.

Grade 3: Large goitre visible from distance.

Data Analysis

Data were entered in Microsoft Excel 2007 and analyzed using SPSS Statistics v20.0. Outcome variables such as age, sex, and goiter grade were expressed as percentage. Chi-square test was used to see the statistical difference in age and sex with goiter grade. $p < 0.05$ was considered statistically significant.

RESULTS

In this study, 504 children in the age group of 6-12 yrs from district Chamba with mean age of 9 ± 1.86 years including 45.8% boys and 54.16% were girls. The sex distribution of Goiter among study population is shown in Figure 1.

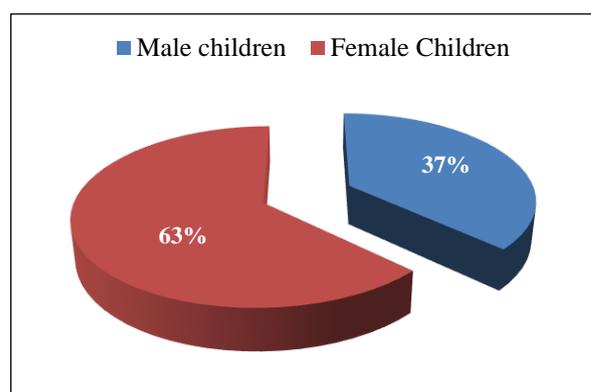


Figure 1: Sex distribution of goitre.

The prevalence of total goitre rate was 16% in this study. Among 81 children, 62 were found to have grade 1 goitre and 19 with grade 2 goitre as per WHO grading system of goiter shown in Figure 2.

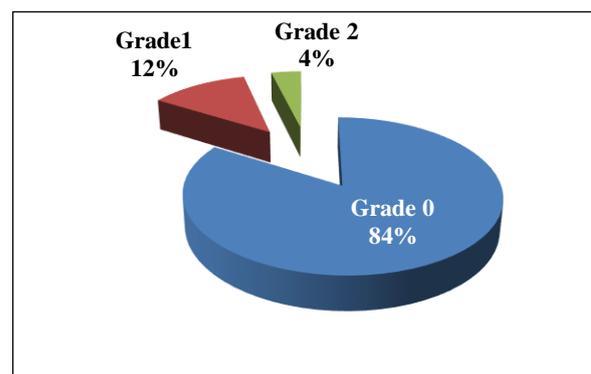


Figure 2: Classification of goitre.

Age and sex wise distribution of total goitre rate among study population shown in Figure 3.

The highest prevalence of TGR was observed in age of 10 years (28.4%) followed by 8 years (25.9%) followed by 9 years (23.5%) and it was significantly higher among girls with p value of 0.044.

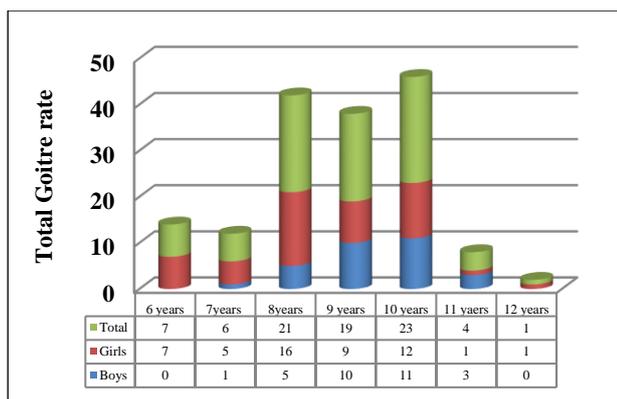


Figure 3: Age and sex wise distribution of TGR.

DISCUSSION

In this study, the prevalence of goitre between age group 6-12 yrs was 16%. Study done by Mohan et al in the rural district of Central India found prevalence of 21.23% among primary school children.⁷ Similar study by Khan et al in District Baramulla of Kashmir valley found the prevalence of 15.29% among children between age group of 6-12 yrs.⁸ In terms of sex distribution, goitre was more among female children as compared to male children in this study. Similar finding were seen in a goitre survey among 6-12 years school children in Himalayan region done by Khan et al which showed the higher prevalence of Goitre among girls compared to boys.⁸ As per survey carried out by women and social welfare department, prevalence of goitre in Chamba was 14.25% in 1999. So, after 20 yrs, when total goitre rate should decrease, it has been increased in this belt which was an alarming situation.

Limitations of the study was the intra and inter observer variation in goitre examination which was controlled by training and random examination of goitre grades by an expert. However, despite all of the training for quality control, there could be still the possibility for misclassification of a normal thyroid gland. Authors could not assess the size of the thyroid gland using ultrasound due to a lack of resources.

CONCLUSION

This study showed mild goitre prevalence in school aged children of 6-12 years in district Chamba of Himachal Pradesh. After 55 years of initiation of salt iodisation programme presence of goitre in children is alarming situation. Authors have to rule out the causes at community level. The district Chamba comes under Himalayan goitre belt and faulty salt storage and cooking practices could be the reason. There is dire need of annual screening of school children for goitre. Ground level

health workers should be trained to examine the goitre so that they can mobilize these children to paediatrician.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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