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Study of goiter occurrence in children in North India region

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Abstract
Normal thyroid function is important for growth and development in young population. Autoimmune thyroiditis is becoming gradually prevalent in children as evident from goiter surveys. Subjects with autoimmune thyroiditis manifest clinically as euthyroidism, sub clinical hypothyroidism, overt hypothyroidism. The data on the goiter and the status of iodine nutrition are not available in the regions. So the study was planned to assess the prevalence of the goiter.
The goiter survey was done in the rural area of the North Indian district. In the study the primary schools were selected to get the proposed goiter population for the study. The school children's between the age of 5-12 years were included from the schools. All the enrolled patients were clinically examined for the goiter i.e. development of the thyroid. The age & the sex of the students were also noted.
In the summary that the present data showed that the prevalence of the goiter in the age group of the 5-13 in the rural area of the north India. The present study indicates that biochemical iodine deficiency due to intake of less iodine is the main cause for the persistence of goitre in the area.

Keywords: goiter, school children, prevalence of goitre

Introduction

A goitre or goiter is a swelling in the neck resulting from an enlarged thyroid gland [1]. The term is also used to describe an enlarged thyroid [2]. A goitre is associated with a thyroid that is not functioning properly.
Worldwide, over 90% of goitre cases are caused by iodine deficiency [3]. The term is from the Latin gutteria. Most goitres are of a benign nature.
Goiter isdenotes to the abnormal development of the thyroid gland. The existence of a goiter does not inevitably mean that the thyroid gland is notworking properly. There are many other reasons also responsible for the malfunctioning of the thyroid gland.
A goitre, associated with hypothyroidism or hyperthyroidism, may be present with symptoms of the underlying disorder. For hyperthyroidism, the most common symptoms are associated with adrenergic stimulation: tachycardia, palpitations, nervousness, tremor, increased blood pressure and heat intolerance. Clinical manifestations are often related to hypermetabolism, (increased metabolism), excessive thyroid hormone, an increase in oxygen consumption, metabolic changes in protein metabolism, immunologic stimulation of diffuse goitre, and ocular changes (exophthalmos) [4]. Hypothyroid individuals may have weight gain despite poor appetite, cold intolerance, constipation and lethargy. However, these symptoms are often non-specific and make diagnosis difficult.
Regarding morphology, goitres may be classified either as the growth pattern or as the size of the growth [citation needed]:

Growth pattern

- Uninodular goitre: one thyroid nodule; can be either an inactive or a toxic nodule.
- Multinodular goitre: multiple nodules [5]. can likewise be inactive or toxic, the latter is called toxic multinodular goitre and associated with hyperthyroidism; thyroid cancer is identified in 13.7% of the patients operated for multinodular goitre. These nodules grow up at varying rates and secrete thyroid hormone autonomously, thereby suppressing TSH-dependent growth and function in the rest of gland [6].
- Diffuse goitre: the whole thyroid appearing to be enlarged due to hyperplasia.

Size

- Class I (palpation goitre): in normal posture of the head, it cannot be seen; it is only found by palpation.
- Class II: the goitre is palpable and can be easily seen.
- Class III: the goitre is very large and is retrosternal; pressure results in compression marks.

Goitre is treated according to the cause. If the thyroid gland is producing too much T3 and T4, radioactive iodine is given to the patient to shrink the gland. If goitre is caused by iodine deficiency, small doses of iodide in the form of Lugol's Iodine or KI solution are given. If the goitre is associated with an underactive thyroid, thyroid supplements are used as treatment. In extreme cases, a partial or complete thyroidectomy is required [7].
Goitre is more common among women, but this includes the many types of goitre caused by autoimmune problems, and not only those caused by simple lack of iodine.
Normal thyroid function is important for growth and development in young population. Autoimmune thyroiditis is

becoming gradually prevalent in children as evident from goiter surveys. Subjects with autoimmune thyroiditis manifest clinically as euthyroidism, sub clinical hypothyroidism, overt hypothyroidism.

The data on the goiter and the status of iodine nutrition are not available in the regions. So the study was planned to assess the prevalence of the goiter.

Methodology

The study was planned in the Career Institute of Medical Sciences and Hospital. Total 100 cases were evaluated for the study.

The survey was done in the rural area of the North Indian district. In the study the primary schools were selected to get the proposed goiter population for the study. The school children's between the ages of 5-12 years were included from the schools.

All the enrolled patients were clinically examined for the goiter i.e. development of the thyroid. The age & the sex of the students were also noted.

Result & Discussion

The data from the 100 enrolled cases were collected and presented as below.

The WHO classifies the goiter in following 3 classes.

- Grade 0: no goiter;
- Grade1: thyroid palpable but not visible;
- Grade 2: thyroid visible with neck in normal position

Table 1: Age Specific Goiter Observation

Age (Yrs)	Goiter Type		
	Grade 0	Grade 1	Grade 2
5-7	13	5	1
7-9	15	9	2
9-11	17	7	3
12-13	16	8	4

The 5-7 year age group showed the 5 cases of Grade-1 & 1 case of Grade-2.

The next 7-9 years of age group shows 9 cases of the Grade-1 & 2 cases of Grade-2. In 9-11 years children's 7 cases of the Grad-1 & 3 cases if Grade-2 was observed. The higher age group of 12-13 years shows 8 cases of the Grade-1 &4 cases of grade-2.

Table 2: Sex Specific Goiter Observation

Sex	Goiter Type		
	Grade 0	Grade 1	Grade 2
Males	36	18	6
Females	25	11	4
Total	61	29	10

There is a significant association between the age of school children and prevalence of goiter. In addition the prevalence among girls was more than boys. The observed result is almost consistent with earlier observations (8-9).

It has been recommended by WHO/UNICEF/ICCIDD that 90% of the household should getiodized salt at the level of 15 ppm [10].

An indication in the iodine content of the soil can be given by the local drinking water concentration. Iodine content in drinking water indicates that study region is environmentally iodine deficient or the soil is poor in iodine according to Seltzer *et al*. [11].

The consumption of cyanogenic plant foods was alsoevident from the urinary excretion of thiocyanate (SCN).In India, large number of cyanogenic plants (SCN precursors) are used as common vegetables and IDD thuspersists in many regions inspite of recommended iodineintake [12, 13]. Indian cyanogenic plant foods that are used ascommon vegetables have potent anti-thyroid activity and supplementation of extra iodine even fails to counteract their effect [14]. In a recent country wide study conducted by Marwaha *et al* (2003) reported that thiocyanate appers to play an important role in goitre formation especially among poor children in India in post iodisation phase [15].

Conclusion

In the summary that the present data showed that the prevalence of the goiter in the age group of the 5-13 in the rural area of the north India. This indicated that the presence of the Iodine in the salt & the food is less. So the action needs to be taken to control such situations. Also it shows that there is need to implement the ban on the non iodized salt in the area. Also the efforts must be taken to improve awareness regarding the use of Iodized salt to avoid the Goiter.

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