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Assessment of iodine deficiency in children age ranged 8-14 years of age

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Abstract

Background: It is found that more than 1.5 billion population of the world are at the risk of iodine deficiency disorders. The present study was conducted to assess iodine deficiency in children.

Materials & Methods: The present study was conducted on 620 children of age ranged 8-14 years of age of both genders. Children were screened for goitre by standard palpation method and were graded according to the criteria recommended WHO. Salt samples were collected and were tested qualitatively on spot with MBI kit and iodine concentration was recorded as 0, <15, >15 ppm.

Results: Out of 620 children, boys were 380 and girls were 240. Grade 0 was seen in 320 boys and 210 girls. Grade 1 was seen in 40 boys and 20 girls and grade 2 was seen in 20 boys and 10 girls. The difference was significant ($P< 0.05$). 0 ppm was seen in 40 boys and 10 girls, <15 ppm in 60 boys and 30 girls and >15 ppm in 280 boys and 200 girls. The difference was significant ($P< 0.05$).

Conclusion: Authors found that iodine deficiency is frequently seen in school children. Grade 1 was seen in 60 children and grade 2 in 30 children.

Keywords: Children, Goiter, iodine

Introduction

It is found that more than 1.5 billion population of the world are at the risk of Iodine Deficiency Disorders (IDD) out of which, it is estimated that about 200 million people are in our country [1]. National Iodine Deficiency Disorders Control Program was launched in India in 1962. But after 44 years of the implementation of the program, a recent nationwide survey revealed that out of 324 districts surveyed, 263 districts were still endemic for iodine deficiency disorders (IDD) with prevalence more than 10 %. People living in areas affected by severe iodine deficiency may have an intelligence quotient (IQ) of up to 13.5 points below that of those from comparable communities in areas where there is no iodine deficiency. This mental deficiency has an immediate effect on child learning capacity, women's health, the quality of life in communities, and economic productivity [2].

Iodine deficiency disorders (IDD) refer to all of the consequences of iodine deficiency in a population that can be prevented by ensuring that the population has an adequate intake of iodine. Salt iodization programmes, like any other health interventions, therefore require an effective system for monitoring and evaluation. The challenge is to apply the IDD indicators using valid and reliable methods while keeping costs to a minimum [3]. The present study was conducted to assess iodine deficiency in children.

Materials & Methods

The present study was conducted in the department of Pediatrics. It comprised of 620 children of age ranged 8-14 years of age of both genders. The study protocol was approved from institutional ethical committee. A written consent was obtained from parents of all children.

Data regarding name, age, gender, etc. was recorded.

Children were screened for goitre by standard palpation method and were graded according to the criteria recommended WHO. Salt samples were collected from the houses of children and were tested qualitatively on spot with MBI kit and iodine concentration was recorded as 0, <15, >15 ppm. Results were tabulated and subjected to statistical analysis. P value less than 0.05 was considered significant.

Results

Table I: Distribution of children

Total- 620		
Gender	**Boys**	**Girls**
Number	380	240

Table I shows that out of 620 children, boys were 380 and girls were 240.

Table 2: Grades of goiter in children

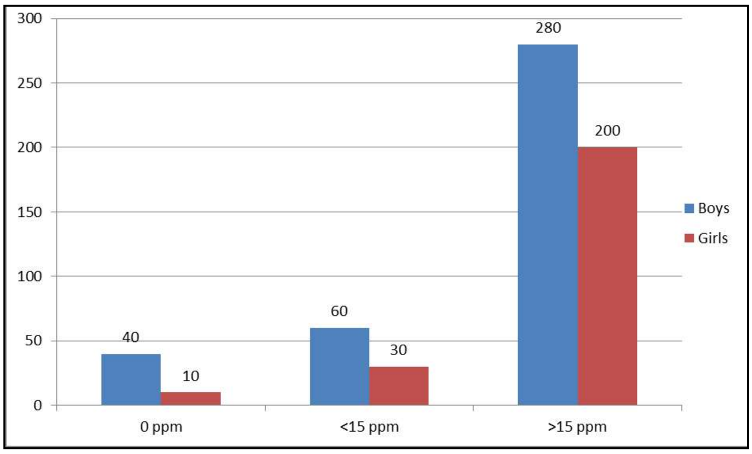
Grade	Boys	Girls	P value
0	320	210	0.05
1	40	20	0.1
2	20	10	0.01

Table In shows that grade 0 was seen in 320 boys and 210 girls. Grade 1 was seen in 40 boys and 20 girls and grade 2 was seen in 20 boys and 10 girls. The difference was significant (P< 0.05).

Table 3: Iodine content in salt

Iodine	Boys	Girls	P value
0 ppm	40	10	0.01
<15 ppm	60	30	0.05
>15 ppm	280	200	0.02

Table III shows that 0 ppm was seen in 40 boys and 10 girls, <15 ppm in 60 boys and 30 girls and >15 ppm in 280 boys and 200 girls. The difference was significant (*P*< 0.05).



Graph I: Iodine content in salt

Discussion

Iodine deficiency occurs when iodine intake falls below recommended levels. It is a natural ecological phenomenon that occurs in many parts of the world [4]. the erosion of soils in riverine areas due to loss of vegetation from clearing for agricultural production, overgrazing by livestock, and tree-cutting for firewood results in a continued and increasing loss of iodine from the soil. Groundwater and foods grown locally in these areas lack iodine. When iodine intake falls below recommended levels, the thyroid may no longer be able to synthesize sufficient amounts of thyroid hormone. The resulting low level of thyroid hormones in the blood (hypothyroidism) is the principal factor responsible for damage to the developing brain and other harmful effects known collectively as "iodine deficiency disorders". The adoption of this term emphasizes that the problem extends far beyond simply goitre and cretinism [5]. The present study was conducted to assess iodine deficiency in children.

In present study, out of 620 children, boys were 380 and girls were 240. We found that grade 0 was seen in boys and 120 girls. Grade 1 was seen in 80 boys and 100 girls and grade 2 was seen in 60 boys and 20 girls. Kapil *et al* [6]. Found that the overall prevalence of goitre in the studied subjects was 12.6%. The median urinary iodine excretion in the study sample was more than 100µg/L Iodine content was found to be adequate in 88% of salt samples. Authors concluded that there was a high prevalence of goitre in young children despite iodine repletion. This calls for identification of factors to strengthen NIDDCP and the need to emphasize use of iodized salt in Haryana.

We found that 0 ppm was seen in 40 boys and 10 girls, <15 ppm in 60 boys and 30 girls and >15 ppm in 280 boys and 200 girls. The difference was significant (P< 0.05).

Joshi *et al*. [7] found that One hundred and fifty eight (78.6%) salt samples were powdered and 43 (21.4%) were of crystalline variety. Sixty nine per cent of salt samples had iodine content of less than 15 ppm. Amongst the children consuming powdered salt, no sample had nil iodine but 61.4% salt samples had less than 15 ppm of iodine. Of the total crystalline salt samples, none had nil iodine but 95.3% had an iodine content of less than 15 ppm. The difference in the iodine content of two salt samples was highly significant (p <0.001).

Assessment and periodic evaluation of the situation requires prevalence surveys of iodine status, including measurement of urinary iodine levels and an analysis of the salt situation. Most countries have completed this step, and now need to do periodic reassessment. Dissemination of findings implies communication to health professionals and the public, so that there is full understanding of the IDD problem, the importance of using iodized salt and the potential benefits of iodine deficiency elimination. This needs to be an ongoing activity [8].

Conclusion

Authors found that iodine deficiency is frequently seen in school children. Grade 1 was seen in 60 children and grade 2 in 30 children.

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