GOITRE PREVALENCE SURVEY IN SCHOOL GOING CHILDREN (6-12 YEARS) OF SRINAGAR DISTRICT OF J & K.

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ABSTRACT: Research question: what is the prevalence of goitre in school going children?
OBJECTIVE: To assess the magnitude of goitre in the age group of 6-12 years in district Srinagar.
STUDY DESIGN: 30-cluster sampling
SETTING: schools of Srinagar district
PARTICIPANTS: 6-12 year old children, both boys & girls.
STATISTICAL ANALYSIS: percentage, rate
RESULTS: Overall prevalence of grade 1st goitre was found in 14.69% (Girls 16.35% ; boys 13.38%).Grade 2nd goitre was noticed in 0.59% of surveyed children (0.96% in Girls & 0.29% in Boys). Total goitre rate (TGR) which is the sum of grade 1st & Grade 2nd was found in 15.27% of children. In Girls the rate was higher to an extent of 17% as compared to Boys were it was 13.67%. As regards magnitude of grade, 1st goitre in different age groups as well as sex differentiation is concerned; we found that grade 1st goitre (both sexes) was more common in the age group of 12 years (18.70%) followed by age group of 7 years (15.52%). In boys, we found that the prevalence of grade 1st was more in age group of 12 years (18.64%) followed by age group of 9 years (14.97%). In girls, the magnitude was found to be higher in the age group of 11 years (20.83%) followed by age group of 12 years (18.77%).Maximum TGR (total goitre rate) was found in the age group of 12 years. In boys the maximum involvement was seen in age group of 12 years (19.49%) followed by that of 9 years (14.97%). In girls maximum involvement was found in age group of 11 year's (21.75%) followed by that of 12 years (20.08%)
KEY WORDS: Goitre, Total Goitre Rate (TGR), prevalence

INTRODUCTION: Endemic goitre, one of the earliest non-communicable diseases to humankind , is an important public health problem of worldwide distribution & the mountainous slopes of Himalayas have been notorious foci of endemic goitre.[1] We call the condition to be endemic once it affects a large no of population approximately 5% in periadolescent or preadolescent children [2]. Goitre is prevalent worldwide with over 600 million people having goitre & 20 million having some degree of brain damage (6 million are cretins) caused by effect of iodine deficiency in pregnancy. [3.] In India it is also widely prevalent with different states giving rates of prevalence. About 200 million people are at the risk of IDD in our country. The survey conducted by the Central & State Health Directorates, ICMR and medical Institutes have clearly demonstrated that not even a single State/UT is free from the problem of Iodine Deficiency Disorders. It is estimated that 71 million populations are suffering from goitre and other iodine deficiency disorders [4]. In J&K the figures also vary from one place to another. A study by Zargar et al [5] in 1995 reported a prevalence of about 45.1% in school going children. Because of the widely prevalent situation in the state, the present study was contemplated to find out the magnitude of the problem so that necessary recommendations are forwarded.

METHODOLOGY: The study was conducted in district Srinagar. 3070 subjects were screened. The subjects were aged 6-12 years from district Srinagar. Two stage cluster sampling was used to select the study sample. In the first stage a total of 30 clusters (Schools) were selected based on probability proportionate to the size of the target population in different zones. Thirty clusters were selected to ensure a valid estimate of the prevalence of the problem. In the 2nd stage 103 children within each cluster were selected. The number of children per cluster was based on the estimated prevalence of 20% with 95% confidence interval with a relative margin of error 10% & a design factor of 2. The formula used to calculate the sample size used was:

$$N = \frac{(z\alpha)^2 Q}{(L)^2 P}$$

Where P= expected prevalence

$z\alpha$ = standard normal deviate (corresponding to α level of significance)

L = relative margin of error

Q = I-P

FINAL SAMPLE SIZE = design effect x N

No of clusters = 30

Sample size per cluster: $\frac{\text{Total sample size}}{30}$

Data were collected using a specially designed questionnaire, including information about name, zone, school, exact age of the child and sex. Clinical examination of the thyroid gland of each child was done through inspection and palpation. Classification of goitre grading was based on the criteria endorsed by WHO/United Nations Children's Fund/International council for the control of iodine deficiency disorders that is as follows:

0 = No palpable or visible goitre

1 = A mass in the neck that is consistent with an enlarged thyroid that is palpable or visible with neck in extended position but not in neutral position. It also moves up in the neck on swallowing

2 = A swelling in the neck that is visible in a neutral position and is consistent with an enlarged thyroid when the neck is palpated

The sum of grades 1 & 2 was taken as total goitre rate.

OBSERVATIONS: Total children surveyed were 3070 in the 30 cluster (schools) of district Srinagar with 103 children in each cluster being surveyed. These accounted for about 1718 Boys& 1352 Girls. The full details are depicted in the following **Table1**:

TABLE 1

Age in yrs	Boys				Girls			total	Grand total
	G0	G1	G2	Total	G0	G1	G2		
6	273	27		300	168	22		190	490
7	222	37		259	158	33	1	192	451
8	209	25	2	236	149	25	3	177	413
9	193	34		227	148	25	1	174	401
10	173	27		200	143	28	3	174	374
11	223	36	1	260	169	45	2	216	476
12	190	44	2	236	183	43	3	229	465
	1483	230	5	1718	1118	221	13	1352	3070

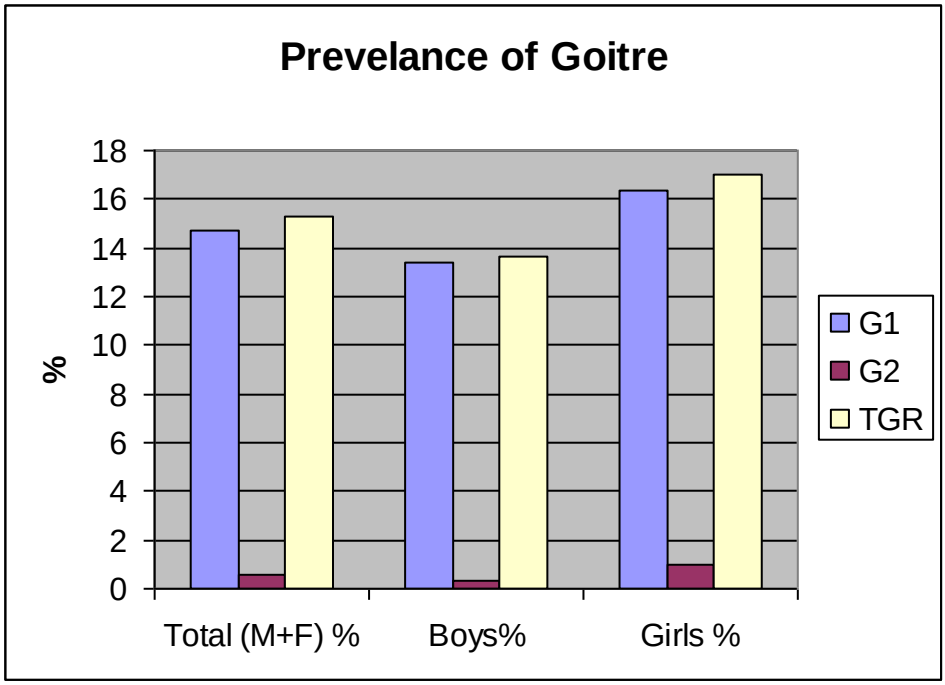
As for as overall prevalence of grade 1st goitre is concerned, we found that 14.69% of the children had grade 1st goitre with figures higher in girls to the tune of 16.35% and in boys it accounted for 13.38%. Grade 2nd goitre was noticed in 0.59% of surveyed children being to the extent of 0.96% in Girls & 0.29% in Boys. Total goitre rate (TGR) which is the sum of grade `1st & Grade 2nd was found to the extent of 15.27%. In Girls the rate was higher to an extent of 17% as compared to Boys were it was 13.67%. The relevant details are shown in table 2 and are graphically represented in figure 1.

TABLE 2: Overall prevalence of goitre:

Grade of goitre	Total (M+F) %	Boys %	Girls %
G1	14.69	13.38	16.35
G2	0.59	0.29	0.96
TGR	15.27	13.67	17

Note: G1 = grade 1st goitre, G2= grade 2nd goitre,
TGR= total goitre rate (G1+G2)

FIGURE 1

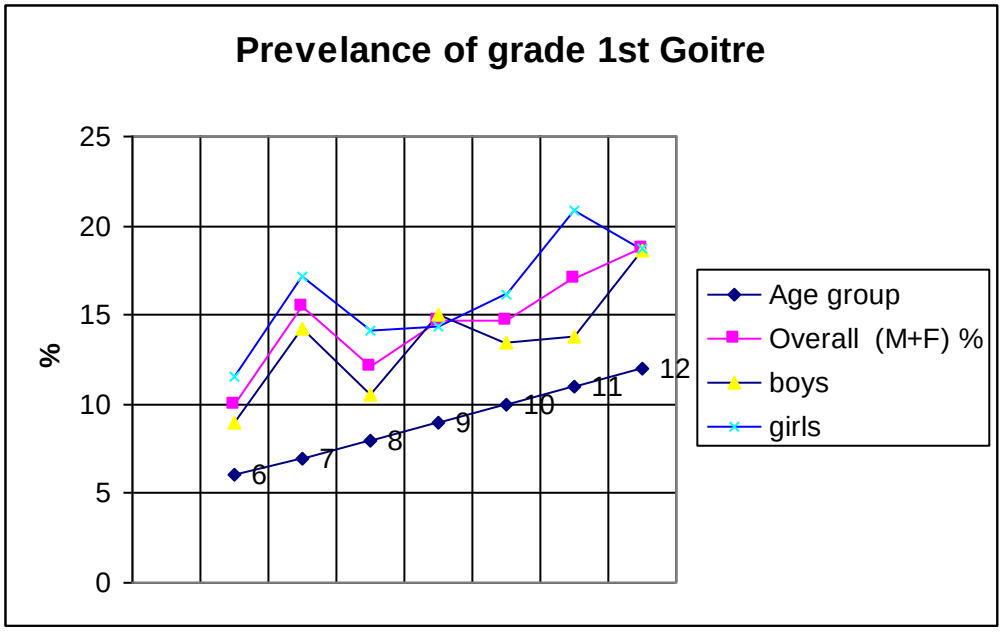


As regards magnitude of grade, 1st goitre in different age groups as well as sex differentiation is concerned; the details are shown in table 3. The table reveals that grade 1st goitre was more common in the age group of 12 years were it was to the extent of 18.70% followed by age group of 7 years were it was 15.52%. Concerning the sex differentiation it is evident from the table that the prevalence was more in age group of 12 years (18.64%) followed by age group of 9 years were it was 14.97%. In girls, the magnitude was found to be higher in the age group of 11 years were it was found to be 20.83% followed by age group of 12 years were it was 18.77%. All these details are shown in **Table 3** and are also represented graphically in **Figure 2.**

TABLE 3: Prevalence rate of grade 1st goitre in different age groups as per sex

Age group	Overall (M+F) %	Boys %	Girls %
6	10	9	11.57
7	15.52	14.28	17.18
8	12.10	10.59	14.12
9	14.71	14.97	14.36
10	14.70	13.5	16.09
11	17	13.84	20.83
12	18.70	18.64	18.77

FIGURE 2

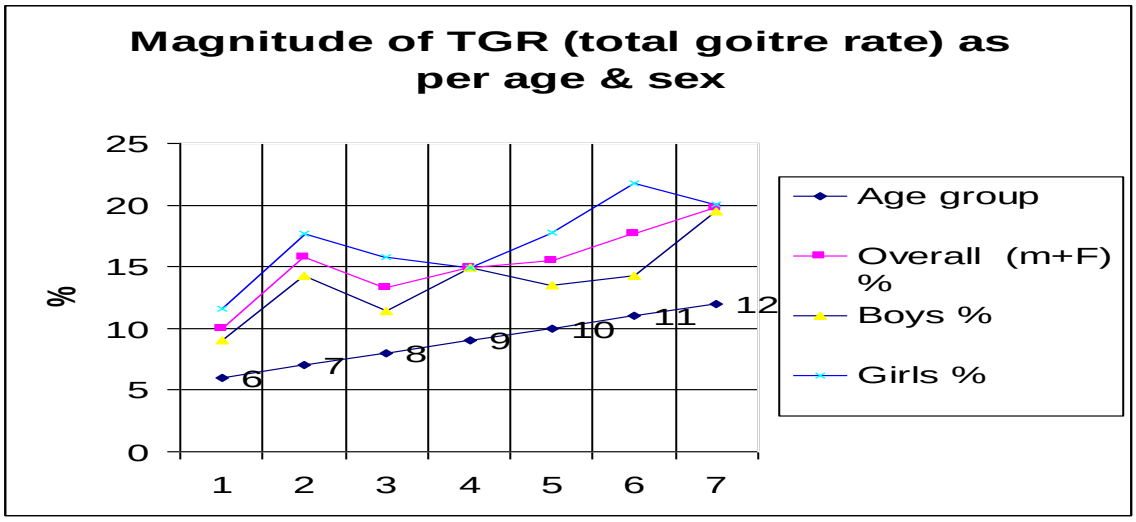


As regards total goitre rate as per sex & age group, the relevant details are shown in table 4. Analysis of the table shows that maximum rate was found in the age group of 12 years. In boys the maximum involvement was seen in age group of 12 years (19.49%) followed by that of 9 years (14.97%). In girls maximum incidence was found in age group of 11 year's (21.75%) followed by that of 12 years (20.08%)

TABLE 4: Total Goitre Rate in different age groups as per sex

Age group	Overall (B+G) %	Boys %	Girls %
6	10	9	11.57
7	15.74	14.28	17.70
8	13.31	11.44	15.81
9	14.96	14.97	14.94
10	15.50	13.5	17.81
11	17.64	14.23	21.75
12	19.78	19.49	20.08

FIGURE 3



DISCUSSION: Goitre is still a big public health problem in developing countries. We found that 14.69% of the children had grade 1st goitre with figures higher in girls to the tune of 16.35% and in boys it accounted for 13.38%. Grade 2nd goitre was noticed in 0.59% of surveyed children being to the extent of 0.96% in Girls & 0.29% in Boys. Total goitre rate (TGR) which is the sum of grade `1st & Grade 2nd was found to the extent of 15.27%. In Girls the rate was higher to an extent of 17% as compared to Boys were it was 13.67%. Zargar AH et al (1997)[6] found the TGR to be 52.08% with G1 in 41.95% & G2 in 10.1% in children of Baramulla district of Kashmir valley. The prevalence was more in boys to the extent of 52.08% & in girls it was 49.23%. In 1995[5] in there study in school children aged 5-15 years they found a TGR of 45.2%.43.9 % in boys & 46.23 in girls respectively.37.74% of children had grade 1st goitre while as 7.44% had grade 2nd goitre. Our figures are lower possibly because of better awareness & sustained IEC activities by the Government about the use of iodized salt and possibly because the age group included was lower. Kapil U et al (2003) [7] in their study in school children aged 6-12 years which they did in Bharatpur district of Rajasthan found the rate to be 7.2% . Grade 1st goitre was seen in 7% & grade 2nd goitre in 0.2% of children. As for as sex is concerned the rates of G1 goitre was 5.7% & 7.9% in girls & boys respectively. Chandra AK et al (2001) [8] in their study in children aged 6-15 years found the TGR to be 21.6% with G1 in 20.2% & G2 to be 1.4%. Brahmbhatt S (2000) [9] in their study in Dang & Baroda districts of Gujarat found the TGR to be 29.6% with G1 in 29.2% & G2 in 0.4 %. Our figures correlate well with there findings. Our figures also correlate with that of Bhardwaj AK et al (1997)[10] who found the TGR to be 20.5% with G1 in 17.8 & G2 in 2.7% of children aged 6-12 years. The rate was found to be 39.3% in boys and 18% in girls.

Grade 1st goitre was more common in the age group of 12 years were it was to the extent of 18.70% followed by age group of 7 years were it was 15.52%. Concerning the sex differentiation it is evident from the table that the prevalence was more in age group of 12 years in boys (18.64%) followed by age group of 9 years were it was 14.97%. In girls, the magnitude was found to be higher in the age group of 11 years were it was found to be 20.83% followed by age group of 12 years were it was 18.77%. in the study by Chandra et al [8] in tripura the maximum involvement was seen in age group of 11 years to the extent of 24.1%.our figures among boys are more probably due to screening

of more boys than girls, since female education is not given much preference hence girls are not encouraged to be present all the times in school. As for as TGR in reference to age & sex ,is concerned we found that maximum TGR (both sexes) was found in the age group of 12 years & 21.75% in the age group of 11 years in girls. Chandra et al (2001)[8] found the TGR to be more in age group of 11 years in both he sexes. Kapil U et al (1996)[11] found that TGR was maximum in the age group of 10 years in both sexes.

CONCLUSION & RECOMMENDATIONS: Goitre is still a major public health problem in J&K. although drastic decrease in the magnitude of the problem has occurred in few years. In this connection we would like to suggest the following measures.

- A Goitre cell needs to be established & strengthening of the same with expertise from community medicine department. In this connection proper lab facilities for urinary iodine excretion as well as for checking the iodine content of salt. It is also essential to set up one district level IDD monitoring laboratory for iodine content of salt and Urinary Iodine Excretion for monitoring proper implementation of the IDD Control Programme. The iodized salt should be distributed through public distribution system also.
- Maximum IEC (Information, Education and Communication) involvement should be ensured so that people are made aware about the consumption of iodized salt. In this connection, help of field publicity wing & Health Education Bureau also needs to be taken. To intensify the IEC activities a communication package by way of video films, posters/danglers and radio/TV spots need to be finalized
- The goitre prevalence rate although very high in district Srinagar yet it appears that the magnitude is lower as compared to other districts as per hospital OPD attendance. Thus to find the exact magnitude of the problem in whole Kashmir valley the survey needs to be done in other districts also.
- To prevent loss of iodization because of environmental loss what is needed is production facility in state also so that this problem is checked. Quality control of the salt with repeated lab investigations thus is very much needed.

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