Goiter Prevalence in School Children in Three Districts of Jammu Region

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ABSTRACT

BACKGROUND: IDD (Iodine Deficiency Disorders) is still a major public health problem in J&K as in other parts of country despite measures taken to combat it. Repeated surveys are only means to monitor the situation.

OBJECTIVE: To study the present prevalence of goiter in various districts of Jammu province.

METHODS: Using EPI 30 cluster methodology, 10800 school children (aged, 6-12 years) were selected from three randomly chosen districts of Jammu province. Subjects were clinically examined and graded for goiter as per joint WHO/UNICEF/ICCIDD recommendations

RESULTS: The goitre prevalence in three districts was observed to be 19.84% with a highest prevalence of 26.75% in Samba district ($p = 0.0001$). Understandably the prevalence of goitre in age group of 6-9 years was lower than that in 9-12 age group. ($p=0.005$)

CONCLUSIONS: Total goiter prevalence rate remains to be at an unacceptable high rate. Preventive public health measures need to be augmented in area along with strengthening of monitoring and surveillance of IDD. JMS 2012;15(1):28-31.

Key Words: Goiter, Prevalence, Jammu, iodine deficiency, IDD

Recent studies at national and regional level have shown that the prevalence of goiter in the region has declined to more than half from previous levels.^{1,2} Yet, it constitutes a major public health problem in Jammu Province with total goiter prevalence rate of 10-11.9%.^{3,4} This is higher than the Kashmir Province as reported by Imtiaz A Bhat *et al*⁵ and Pandit Mohammad *et al*.³ Monitoring and evaluation of the impact of programmes to control Iodine deficiency disorder (IDD) are crucial in order to ensure that interventions are both effective and safe. Current recommendations are that countries conduct a national survey on the status of IDD in populations every 3-5

years.⁶ In 2008, 4 more districts were carved in Jammu Province hence the study was taken up by the authors to know the post iodization scenario in Jammu region.

Methods

Multistage cross sectional study was done. In 1st stage; 3 Districts were chosen randomly out of 10 districts of Jammu province. In second stage, zone wise educational institutes were identified from the list procured from chief educational officer giving due representation to urban and rural areas. Thus, 7-10 coeducational schools were selected randomly from various zones. Using EPI 30 cluster sampling methodology 120 students with 20 students in each 6 age categories were selected.⁷ The required sample size of 3600 students was calculated considering minimum prevalence of goiter at 10% with 10% allowable error (using formula $4pq/L^2$). All the

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children were examined by a pre trained team of postgraduates and grading of goiter was done as per criteria recommended by joint WHO/UNICEF/IAs study was conducted under aegis of our department; urinary excretion of iodine was not done because of non availability of resources in Biochemistry Department of College. The results were compiled and statistical analysis was done by using Epi info.

Results

10800 school children in age group of 6-12 years were screened for goiter in all, with 3600 school children in each 3 selected districts of Jammu province.

Total goiter prevalence rate was highest in Samba district (26.75) followed by 26.25% in Udhampur District and 21.7% in Jammu District. This interdistrict variation in prevalence of goiter was also observed to be statistically significant ($p = .0001$) and same has been shown in Table 1.

This table also shows the severity of goiter. Grade I goiter was more prevalent in Samba district (21.25%) as compared to grade II goiter which was higher in Udhampur district this was

was compared it was observed that there was no statistically significant difference between 2 sexes in both age categories and same has been shown in table 2.

25.46% ($n=1317$) children had goiter in rural areas where as 24.38% ($n=1317$) had goiter in urban areas. When

TABLE 2. Age and Sex wise Goiter prevalence in three districts of Jammu province

Age in years	Sex	No. of children examined	G0	G1	G2	Total goiter Prevalence (%) G1 + G2p	p value
6-9	M	3237	2517	596	124	720 (22.24%)	0.683
	F	2161	1693	400	68	468 (21.66%)	
9-12	M	3198	2317	706	175	881 (27.54%)	0.966
	F	2204	1581	503	120	623 (28.26%)	

Table 1. Prevalence of Goiter in Three Districts of Jammu Province

District	Sex	No. of students examined	No. of students with goiter n(%)	Grade of goiter		Total Goiter Rate (TGR)
				Grade I n(%)	Grade II n(%)	
Jammu	M	2168	491 (22.64)	723 (20.08)	61 (1.69)	21.7%
	F	1432	293 (20.46)			
	T	3600	784 (21.78)			
Udhampur	M	2256	520 (23.04)	171 (19.92)	228 (6.33)	26.25%
	F	1344	425 (31.62)			
	T	3600	945 (26.25)			
Samba	M	2146	590 (27.49)	765 (21.25)	198 (5.5)	26.75%
	F	1454	373 (25.65)			
	T	3600	963 (26.75)			

P value (boys vs. Girls): 0.211, 0.0001, 0.351 for Jammu, Udhampur, Samba, respectively

also observed to be statistically highly significant at p value of .00001. It was also observed that 24.87% of screened males had goiter as compared to 24.99% of females but this gender difference was not statistically significant. When this data was further analysed for variation of goiter prevalence in either of sex and spatial distribution, it was observed that 31.62% of females in Udhampur district had goiter as compared to 23.04% of males, this was also found to be statistically highly significant with p value of .0001. (Table 2)

According to age, 27.84% ($n=1504$) of children had goiter in age group of 9-12 years as compared to only 22.0% ($n=1188$) students who had goiter in age group of 6-9 years. This was also observed to be statistically highly significant at p value $< .005$ (χ^2 42.9 df=1). But when age and sex prevalence

analysed for severity of goiter 3.5% ($n=192$) had grade II goiter in urban areas as compared to 5.46% ($n=295$) children from rural areas. This was also observed to be statistically significant at p value of .00004 and same has been depicted in Table 3.

Discussion

Present study was based on only clinical examination of 10800 children between age of 6-12 years taking baseline prevalence of goiter at 10% with allowable error of 10%. To take care of confounding because of pubertal goiter, 6-12 years age group children were taken. Total goiter prevalence came out to be 24.9% as compared to 11.98% as reported by Imtiaz A Bhat *et al.*⁵ This is almost double than previous report and quite high in contrast to goiter prevalence from Srinagar region which was

TABLE 3. Distribution of Goiter in Urban and Rural children (Age 6-12yrs) in three Districts of Jammu

Spatial	Presence of goiter and Severity			Total goiter Prevalence (%)
	Goiter Distribution G0	Absent G1	Present G2	
Urban	4083 (75.62%)	1125 (20.83%)	192 (3.55%)	24.38%
Rural	4025 (74.53%)	1080 (20.00%)	295 (5.46%)	25.46%
Combined	8108 (75.07%)	2205 (20.41%)	487 (4.50%)	24.92%

reported to be at 5.57% by Rafiq M in 2006.² However, these figures have almost halved from previously reported prevalence of 45.2% in 19951. Our study conforms to Marwaha R.K. *et al*⁹ who also reported total goiter rate of 23% in 14762 school children aged 6-18 years from different states and Union territories. High prevalence of goiter has also been reported by other authors.¹⁰ When district wise data was analysed, Jammu district showed higher prevalence (21.7%) as compared to earlier study done by by Imtiaz A Bhat *et al*.⁵ This difference may be because of small sample size and different sample unit in their study as compared to ours. Moreover district Samba which was erstwhile part of Jammu district had highest total goiter prevalence than all other districts in the study group which supports our results.

Overall, there was no gender difference in goiter prevalence rate but in Udhampur district 31.62% of females had goiter as compared to 23.04% of males. Similar finding were reported by Masoodi MA *et al* in their study done in to 2003-04 who observed that total goiter rate was 17% in girls and 13.67% in boys in the age group of 6-12 years.¹¹ Similar results have been observed by other authors in their studies.^{12,13,14} Pandit Mohamed Iqbal³ also reported statistically significant higher prevalence of goiter amongst females of Jammu region (16.1% vs 11%) as compared to males respectively.

In our study, age and prevalence of goiter was significantly associated as 27.84% of children had goiter in age group of 9-12 years as compared to only 22.0% of children in 6-9 years age category. This conforms to the study done by Imtiaz A Bhat *et al*⁵ who reported that 12.8% of children aged 9-12 years had goiter as compared to 10.6% children in 6-8 years age category.

Children from rural areas showed higher but statistically non significant goiter prevalence as compared to children from urban areas (25.46% vs 24.38% respectively) But Grade II goiter was more common in rural areas as compared to urban areas and this was also significantly associated.

Limitation of the study was that since we did not assess the adequacy of Iodine in salt or measure urinary excretion of

iodine in surveyed population; we cannot say with authenticity that in our area the high prevalence of goiter is due to programme inefficiency or because of other micronutrient deficiencies, auto immunity or higher presence of thiocyanates as suggested by other authors in their studies.^{15,16,17} According to NFHS-3 (2005-06) out of 100 samples of edible salt which were tested for iodine content in Jammu region; 9.5% of samples were non iodized; 14.7% of samples had inadequate iodine content (<15ppm) while 75.8% of samples had adequate iodine content (15 + ppm).¹⁸ Bhat IA *et al* also observed that 98.1% of salt samples were adequately iodized yet; in Jammu region Median urinary iodine excretion was 96.5 ug/L while in Kupwara district (Kashmir Division) it was 300 ug/L.⁵

Conclusion

Total goiter prevalence in studied population is much higher (24.09%) than previously reported study (12%) in 2008. This calls for immediate attention of authorities to augment the goiter control measures for sustainability of NIDDCP and increase awareness as regards to IDD in the general public..

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