



Prevalence of goiter and thyroid nodule and analysis of the association between anthropometric measurements and thyroid volume in children

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Objective

Goiter is a known as thyroid gland enlargement result of iodine deficiency [1]. Iodine deficiency disorder (IDD) is a global public health problem due to representation of the main cause of preventable mental retardation and permanent brain damage in fetus, infant, and childhood [2,3.]. Other harmful effects of iodine deficiency include increased incidence of still births, abortion, infant and child mortality, and congenital abnormalities such as endemic cretinism [1,3]. In 2011, we evaluated the iodine status and goiter incidence of our region by using physical examination and urinary iodine levels (4). In that study we found the goiter frequency was 17.5% of the whole cohort and additionally, iodine deficiency was found in 64.2% of all children. From this date, any new iodination study was not in performed in our area. Therefore, in present study we evaluated children by using ultrason (US) method for goiter prevalence due to acceptance of not changing of iodine deficiency rate in our area. In present study, we aimed to determine goiter and nodule prevalence by ultrasonography in school-children aged 6-17 years in a Van, in which goiter is thought to be endemic and in area there has never been performed determination of goiter prevalence by using US before. So our study is the first study to determine the goiter and nodule prevalence by using US in Van, in Eastern Turkey.

Material and methods and Results

Material-methods

Schools governed by Ministry of Education in Van province were included into the study. Sonographic evaluations of thyroid glands were performed in children aged 6-17 years, and weight, height, waist circumference, hip circumference, and skinfold thickness were measured in subjects

Results

Overall, 2284 school children were included to the study. Median age was 11.08 years in participants. When the association between age and goiter prevalence was analyzed according to World Health Organization parameters, it was found that 10.2% of children and adolescents had goiter and 0.8% of these had a nodule. These ratios were 9.4% and 1% among girls whereas 11.3% and 0.7% in boys, respectively.

Table 1. The range, mean, median, and standard deviation of the thyroid gland volume for age and gender

Age (yr)		N	Right thyroid lobe (cm3)				Left thyroid lobe (cm3)				Total thyroid volume (cm3)			
			mean	SD	median	97p	mean	SD	median	97p	mean	SD	median	97p
6	Boys	70	2,23	0,68	2,09	4,06	2,38	0,80	2,21	4,58	4,62	1,40	4,40	7,99
	Girls	86	2,39	0,96	2,13	5,05	2,50	0,94	2,21	4,65	4,90	1,82	4,37	9,22
7	Boys	83	2,32	0,69	2,08	4,57	2,33	0,59	2,25	3,53	4,65	1,21	4,36	7,58
	Girls	103	2,48	0,99	2,33	4,81	2,52	0,86	2,34	5,10	5,01	1,75	4,59	9,92
8	Boys	113	2,73	1,21	2,4	6,49	2,74	1,08	2,54	4,91	5,47	2,22	4,97	10,73
	Girls	113	2,77	0,97	2,54	5,24	2,86	0,89	2,8	5,37	5,63	1,76	5,29	10,47
9	Boys	113	2,84	1,06	2,6	5,61	2,81	1,08	2,61	5,55	5,65	2,07	5,26	10,93
	Girls	167	2,78	1,02	2,55	5,34	2,81	0,95	2,6	5,58	2,59	1,85	5,27	10,77
10	Boys	118	2,97	0,92	2,85	4,86	2,86	0,77	2,73	4,54	5,83	1,58	5,61	9,12
	Girls	138	3,05	1,04	2,88	5,84	2,98	0,94	2,76	5,83	6,04	1,9	5,71	11,71
11	Boys	110	3,31	1,18	3,13	6,42	3,24	1,2	3,07	5,67	6,56	2,23	6,31	11,47
	Girls	130	3,43	1,34	3,14	6,05	3,41	1,1	3,19	5,61	6,84	2,32	6,55	11,52
12	Boys	74	3,32	1,02	3,25	5,84	3,28	0,89	3,18	5,71	6,61	1,81	6,35	11,14
	Girls	108	3,7	1,12	3,64	6,07	3,6	1,16	3,39	6,72	7,31	2,1	7,01	12,38
13	Boys	81	3,6	1,04	3,62	5,76	3,61	1,02	3,47	5,96	7,22	1,95	7,04	11,56
	Girls	93	4,16	1,4	3,86	7,61	4,01	1,32	3,75	6,41	8,17	2,49	7,92	13,94
14	Boys	81	4,11	1,34	3,95	7,49	4,00	1,16	3,82	6,69	8,12	2,36	7,77	13,35
	Girls	105	4,34	1,57	4,10	8,29	4,07	1,32	3,92	6,87	8,41	2,59	8,22	14,44
15	Boys	51	4,72	2,03	4,49	10,4	4,49	1,44	4,35	8,03	9,22	3,33	8,79	17,8
	Girls	105	4,6	1,71	4,52	8,54	4,43	1,65	4,2	8,65	9,04	3,18	8,79	16,60
16	Boys	60	4,88	2,13	4,73	10,6	4,66	1,8	4,56	9,19	9,55	3,65	8,98	17,99
	Girls	74	4,9	1,73	4,88	8,97	4,51	1,44	4,37	7,65	9,41	3,04	9,33	16,48
17	Boys	51	4,86	2,2	4,65	10,67	4,77	1,92	4,61	9,37	9,63	3,95	9,65	19,68
	Girls	55	4,83	1,49	4,72	7,53	4,78	1,91	4,64	7,10	9,61	3,07	9,76	16,20

Table 2. Shows comparison of frequency of goiter and nodula presence according to genders and ages

Yaş	Boys			Girls		
	Goiter n (%)	Nodula n (%)	Long axis of nodule (mm)	Goiter n (%)	Nodula n (%)	Long axis of nodule (mm)
6	13 (18.6)*	0 (0)**	-	28 (32.6)	1 (1.2)	7.5
7	16 (19.3)**	0 (0)**		22 (21.4)	0 (0)	
8	24 (21.2)**	1 (0.9)**	10	17 (15)	0 (0)	
9	19 (16.8)*	0 (0)**		15 (9.0)	0 (0)	
10	13 (11)**	1 (0.8)**	6	7 (5.1)	2 (1.4)	6, 4
11	11 (10)**	1 (0.9)**	5	13 (10)	1 (0.8)	9
12	5 (6.8)**	0 (0)**		4 (3.7)	0 (0)	
13	1 (1.2)***	0 (0)**		4 (4.3)	0 (0)	
14	2 (2.5)**	0 (0)**		3 (2.9)	1 (1)	6
15	1 (2.0)**	1 (2.0)**	11	4 (3.8)	4 (3.8)	5.5, 6, 7, 7
16	5 (8.2)**	1 (1.6)**	7	2 (2.7)	3 (4.1)	5,6, 6
17	3 (5.9)**	1 (2.0)**	5	1 (1.8)	1 (1.8)	14
Total	117 (11.3)**	7 (0.7)**	Boys and	120 (9.4)	13 (1)	

Conclusion

It was seen that iodine deficiency is still endemic in Van province. In addition, to best of our knowledge, this is the first study showing the relationship between triceps skinfold thickness and thyroid volume.

References

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