European Journal of Molecular & Clinical Medicine

ISSN 2515-8260 Volume 9, Issue 6, 2022

ORIGINAL RESEARCH

ASSESSMENT OF THYROID CANCER IN CHILDREN

[1]Dr.Bimal Barot, [2]Dr.Bhavi Shah, [3]Dr Mahendra Mehta, [4]Dr Sunil Rsiklal Joshi

[1,2]Assistant Professor, Department of Paediatrics, Banas Medical College and Research Institute, Palanpur, Gujarat, India
[3]Assistant Professor, Department of ENT, Zydus Medical College, Dahod, Gujarat, India
[4]Associate Professor, Department of General Surgery, Banas Medical College and Research Institute, Palanpur, Gujarat, India

Correspondence:
Dr Sunil Rsiklal Joshi
Associate Professor, Department of General Surgery, Banas Medical College and Research Institute, Palanpur, Gujarat, India
Email: dr_sunil_joshi@yahoo.com

ABSTRACT

Background: Pediatric thyroid cancer is a rare entity that is treatable with an excellent prognosis. The present study was conducted to assess thyroid cancer in children.

Materials & Methods: 56 pediatric patients of suspected nodules of both genders were included. Serum TSH was measured in all children referred for suspected thyroid nodules. Hypothyrotropinemic patients underwent ^{123}I scintigraphy to assess for nodule autonomy. Thyroid ultrasonography was performed with a 5 to 18 MHz transducer.

Results: Out of 56 patients, boys were 30 and girls were 26. The number of nodules ≥ 1 cm per patient was 1 seen in 46, 2 in 7, 3 in 2 and 5 in 1 patient. Lobe involved were bilateral in 10, isthmus in 4, right lobe in 24 and left lobe in 20 patients. The difference was significant (P< 0.05). Cystic content was 0% (solid) in 60%, <25% in 25%, 25-50% in 10%, 50-75% in 3% and >75% in 2%. Calcifications was present in 84% and absent in 16%. Nonspecific lymph node enlargement was present in 55% and absent in 45%. The difference was significant (P< 0.05).

Conclusion: Pediatric patients with discrete thyroid nodules ≥ 1 cm in maximum diameter have greater relative cancer risk.

Key words: Pediatric thyroid cancer, Hypothyrotropinemic, Lobe

INTRODUCTION

Pediatric thyroid cancer is a rare entity that is treatable with an excellent prognosis. In spite of the fact that as compared to its adult counterpart pediatric differentiated thyroid cancer (DTC) presents at an advanced stage and has higher recurrence rates, mortality due to the disease is rare.[1] This paradox is because this disease probably represents a different subset of thyroid cancers with a unique biological behaviour. It therefore becomes imperative to correctly identify and treat this condition.[2] Though adult thyroid cancers are much more

common, even their management has been a subject of debates. This debate assumes greater importance in children where treatment complications and sequelae coupled with long life span may spell prolonged morbidity to the patient. While there have been controversies regarding the optimal management of pediatric DTC, guidelines and consensus are now evolving.[3]

Neck ultrasonography and fine-needle aspiration are diagnostic mainstays in the evaluation of adults with thyroid nodules, and the American Thyroid Association recommends the application of these tools in children. However, some experts dispute their appropriateness in this age group due to concerns about the trauma of biopsy and the risks of repeated sedation.[4] This controversy is further fueled by wide variability in the reported cancer prevalence of childhood nodules because estimates as high as 70% have been used to justify referring children directly for surgery.[5] Unfortunately, most pediatric series are small and retrospective, with widely variable diagnostic methods and inclusion criteria.[6]The present study was conducted to assess thyroid cancer in children.

MATERIALS & METHODS

The present study comprised of 56 pediatric patients of suspected nodules of both genders. Parents of all children gave their written consent.

Data such as name, age, gender etc. was recorded. Serum TSH was measured in all children referred for suspected thyroid nodules. Hypothyrotropinemic patients underwent ^{123}I scintigraphy to assess for nodule autonomy. Thyroid ultrasonography was performed with a 5 to 18 MHz transducer.Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 56		
Gender	**Boys**	**Girls**
Number	30	26

Table I shows that out of 56 patients, boys were 30 and girls were 26.

Table II Assessment of parameters

Parameters	**Variables**	**Number**	**P value**
No. of nodules ≥ 1 cm per patient	1	46	0.01
	2	7	
	3	2	
	5	1	
Lobe involved	Bilateral	10	0.05
	Isthmus	4	
	Right lobe	24	
	Left lobe	20	

Table II, graph I shows that no. of nodules ≥ 1 cm per patient was 1 seen in 46, 2 in 7, 3 in 2 and 5 in 1 patient. Lobe involved were bilateral in 10, isthmus in 4, right lobe in 24 and left lobe in 20 patients. The difference was significant (P< 0.05).

Graph I Assessment of parameters

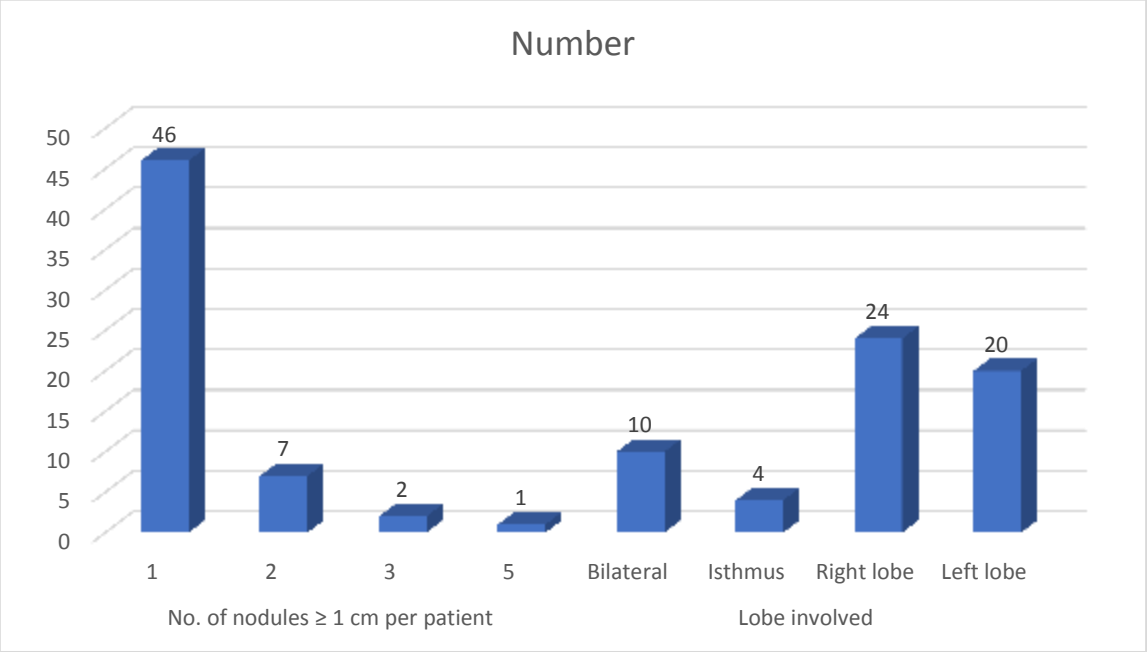

Table III Characteristics of nodules

Parameters	Variables	Number	P value
Cystic content	0% (solid)	60%	0.05
	<25%	25%	
	25-50%	10%	
	50-75%	3%	
	>75%	2%	
Calcifications	Present	84%	0.01
	Absent	16%	
Nonspecific lymph node enlargement	Present	55%	0.17
	Absent	45%	

Table III shows that cystic content was 0% (solid) in 60%, <25% in 25%, 25-50% in10%, 50-75% in 3% and >75% in 2%. Calcifications was present in 84% and absent in 16%. Nonspecific lymph node enlargement was present in 55% and absent in 45%. The difference was significant (P< 0.05).

DISCUSSION

Pediatric thyroid cancer is a rare entity accounting for less than 5% of all thyroid cancers.[7] This intriguing disease is characterized by advanced presentation, coupled with frequent lymph nodal metastases and often pulmonary metastases.[8] It perhaps exhibits a distinct biology and behaviour, because in spite of its aggressiveness, survival is extremely good.[9] This mandates meticulous treatment decisions that are well executed, because the

complications of therapy in patients with good survival may spell prolonged morbidity.[10,11] Being an unusual disease, it is unlikely that level I evidence guiding the management will come forth.[12,13] The present study was conducted to assess thyroid cancer in children.

Out of 56 patients, boys were 30 and girls were 26. The number of nodules ≥ 1 cm per patient was 1 seen in 46, 2 in 7, 3 in 2 and 5 in 1 patient. Lobe involved were bilateral in 10, isthmus in 4, right lobe in 24 and left lobe in 20 patients. Antonelli et L[14]in their study A total of 64 children aged 4 to 16 years from this area who had been diagnosed with differentiated thyroid carcinoma. The female/male ratio was 1.4:1.0. At the time of the first diagnosis the mean age of the children was 9.4 6 2.8 years, and at the time of the accident their mean age was 3.8 years. More than 90% of the patients were less than 6 years of age and 3 were still in utero at the time of the accident. The period of latency between the accident and the first diagnosis was 5.6 years. Their ages at the time of the first diagnosis and their ages at the time of the accident were significantly correlated; there was no significant correlation between the age of each child at the time of the accident and the latent period before the onset of carcinoma. The aggressiveness of the tumor, evaluated on the basis of T stage, lymph node status, and lung metastases, did not correlate with age at the time of the first diagnosis or with the age at the time of the accident.

We found that cystic content was 0% (solid) in 60%, <25% in 25%, 25-50% in 10%, 50-75% in 3% and >75% in 2%. Gupta et al[15] found that of 300 consecutive children referred for the initial evaluation of suspected thyroid nodules were diagnosed with autonomous nodules by scintigraphy. Neck ultrasonography performed in the remainder revealed that biopsy was unnecessary in over half, either by documenting only sub-centimeter nodules or showing that no nodule was present. A total of 125 children met criteria for thyroid biopsy, which was performed without complication. Their rate of cancer was 22%, significantly higher than the adult rate of 14%.

We observed that calcifications was present in 84% and absent in 16%. Nonspecific lymph node enlargement was present in 55% and absent in 45%. Most surgeons prefer to perform a total thyroidectomy for pediatric DTCs and the arguments in favour of this are multifold: (a) Multifocal disease occurs in 40% of pediatric PTC, and has a greater risk for recurrence; (b) Pediatric DTC commonly has regional lymph node disease and a greater risk for distant metastasis; (c) Total thyroidectomy will facilitate the future use of radioactive iodine (RAI) where indicated; (d) Post-operative RAI scans and thyroglobulin assays can be best used after total thyroidectomy, these are especially useful in picking pulmonary metastases that may be undetected on initial X-ray.[16]

The limitation the study is small sample size.

CONCLUSION

Authors found that Pediatric patients with discrete thyroid nodules ≥ 1 cm in maximum diameter have greater relative cancer risk.

REFERENCES

1. Niedziela M (2006) Pathogenesis, diagnosis and management of thyroid nodules in children. EndocrRelat Cancer 13(2):427–453.
2. Rachmiel M, Charron M, Gupta A, Hamilton J, Wherrett D, Forte V, Daneman D (2006) Evidence-based review of treatment and follow up of pediatric patients with differentiated thyroid carcinoma. J PediatrEndocrinolMetab: JPEM 19(12):1377–1393.
3. Reiners C, Demidchik YE (2003) Differentiated thyroid cancer in childhood: pathology, diagnosis, therapy. PediatrEndocrinol Rev: PER 1(Suppl 2):230–235.
4. Zaydfudim V, Feurer ID, Griffin MR, Phay JE (2008) The impact of lymph node involvement on survival in patients with papillary and follicular thyroid carcinoma. Surgery 144(6):1070–1077.
5. Samuel AM, Rajashekharrao B, Shah DH (1998) Pulmonary metastases in children and adolescents with well-differentiated thyroid cancer. J Nucl Med: Off Publ SocNucl Med 39(9):1531–1536.
6. Hay ID, Gonzalez-Losada T, Reinalda MS, Honetschlager JA, Richards ML, Thompson GB (2010) Long-term outcome in 215 children and adolescents with papillary thyroid cancer treated during 1940 through 2008. World J Surg 34(6):1192–1202.
7. Vassilopoulou-Sellin R, Goepfert H, Raney B, Schultz PN (1998) Differentiated thyroid cancer in children and adolescents: clinical outcome and mortality after long-term follow-up. Head Neck 20 (6):549–555 31.
8. O'Gorman CS, Hamilton J, Rachmiel M, Gupta A, Ngan BY, Daneman D (2010) Thyroid cancer in childhood: a retrospective review of childhood course. Thyroid: Off J Am Thyroid Assoc 20 (4):375–380.
9. Fassina AS, Rupolo M, Pelizzo MR, Casara D (1994) Thyroid cancer in children and adolescents. Tumori 80(4):257–262.
10. Kumar A, Bal CS (2003) Differentiated thyroid cancer. Indian J Pediatr 70(9):707–713 10.
11. Samuel AM, Sharma SM (1991) Differentiated thyroid carcinomas in children and adolescents. Cancer 67(8):2186–2190.
12. Farahati J, Parlowsky T, Mader U, Reiners C, Bucsky P (1998) Differentiated thyroid cancer in children and adolescents. Langenbeck's Arch Surg/Deut Ges Chir 383(3–4):235–239.
13. Bal CS, Padhy AK, Kumar A (2001) Clinical features of differentiated thyroid carcinoma in children and adolescents from a subHimalayan iodine-deficient endemic zone. Nucl Med Commun 22 (8):881–887.
14. Antonelli A, Miccoli P, Derzhitski VE, Panasiuk G, Solovieva N, Baschieri L. Epidemiologic and clinical evaluation of thyroid cancer in children from the Gomel region (Belarus). World journal of surgery. 1996 Jul;20(7):867-71.
15. Gupta A, Ly S, Castroneves LA, Frates MC, Benson CB, Feldman HA, Wassner AJ, Smith JR, Marqusee E, Alexander EK, Barletta J. A standardized assessment of thyroid nodules in children confirms higher cancer prevalence than in adults. The Journal of Clinical Endocrinology & Metabolism. 2013 Aug 4;98(8):3238-45.

16. Reiners C, Demidchik YE (2003) Differentiated thyroid cancer in childhood: pathology, diagnosis, therapy. PediatrEndocrinol Rev: PER 1(Suppl 2):230–235, discussion 235–236.