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Research Paper

Morphological Study of Fetal Thyroid Gland in Different Gestational Ages

Medical Science

KEYWORDS : spontaneously aborted , vernier caliper , fetal thyroid glands

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ABSTRACT

This study was performed on 40 spontaneously aborted human fetuses aged between 13 and 40 weeks of gestation. Fetuses without any external and internal pathology or anomaly were included in this study. Fetuses were divided into seven groups based on gestational ages as follows: first group 13-16 weeks, second group 17-20 weeks, third group 21-24 weeks, fourth group 25-28 weeks, fifth group 29-32 weeks, sixth group 33-36 weeks and seventh group 37-40 weeks. The dimensions (length, width, thickness and weight) of the fetal thyroid glands were determined by vernier caliper instrument. The dimensions and ratios of the fetal thyroid gland (weight/fetal body weight) were evaluated. The dimensions of fetal thyroid glands increased with gestational age. This study gives knowledge of thyroid growth differentiation in different gestational ages.

Introduction

In human beings, the thyroid gland is one of the largest of the endocrine organs. It is one of the earliest endocrine organs to differentiate and has an important hormonal role in embryonic development (11). It is composed of two lateral lobes connected by a narrow median isthmus in front of the trachea in anterior lower neck (7). The important function of thyroid hormones is that it maintains the level of metabolism in almost all the body cells that is optimal for their normal function. The importance of thyroid gland is to promote growth and development of the brain during fetal life and for the first few years of postnatal life. Iodine deficiency is the single most common cause of preventable mental retardation and brain damage in the world (11). Persistence of pyramidal lobe, thyroglossal cysts, agenesis of the thyroid gland and aberrant thyroid are the major developmental anomalies of the thyroid gland (7). The aim of present study is to highlight morphological changes at various developmental stages of the thyroid gland in Mumbai population, thereby giving knowledge of growth of thyroid gland.

Materials and Methods

We dissected 40 spontaneously aborted fetuses ranging from 13-40 weeks of gestational age which are collected from labour ward in MGM Hospital Kalamboli, Navi Mumbai with proper records after permission from the Ethical Committee. All the fetuses were preserved in 10%formalin by multiple injection method and dissected the neck region to study the thyroid and its relations. Various parameters like Crown-rump length, Crown-heel length were measured with thread and scale in mm and body weight of the fetus were recorded by weighing machine. We had dissected over the neck and gland was removed. Dimensions of thyroid gland were recorded by vernier caliper.

Results and Observations

In our study body weight of fetuses showed gradual increase from 13th week to 40th week of gestation. The crown-rump length gradually increases as the gestational age of fetus increased. We measured the dimensions (length, width and thickness) of fetal thyroid gland by vernier caliper. Here we observed that there was no more difference between right and left lobe but dimensions of thyroid gland increased as gestational age advanced.

Table: 1- Mean of dimensions of thyroid gland.

Sr. No	Gestational Ages in wk	No. of fetuses	Length mm		Width mm		Thickness mm	
			Right lobe	Left lobe	Right lobe	Left lobe	Right lobe	Left lobe
1.	13 – 16	5	4.98	4.99	2.14	2.16	1.45	1.47
2.	17 – 20	5	7	7.02	3.14	3.14	2.23	2.23
3.	21 – 24	6	8.25	8.26	3.82	3.83	2.71	2.72
4.	25 – 28	9	8.93	8.94	4.49	4.5	2.89	2.9
5.	29 – 32	5	9.91	9.91	5.04	5.05	3.44	3.43
6.	33 – 36	5	10.71	10.71	5.61	5.63	3.92	3.94
7.	37 – 40	5	12.02	12.05	6.35	6.38	4.71	4.73

Figure: 1- Length of fetal thyroid gland

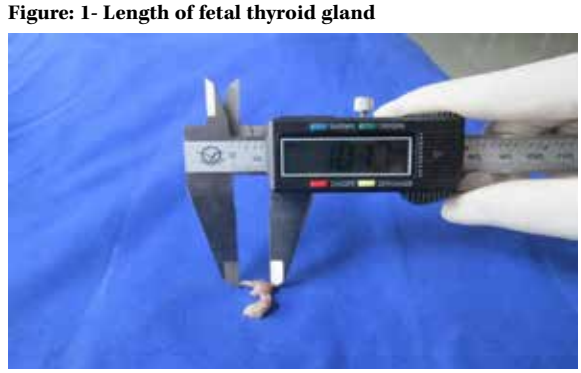

Figure: 2- Width of the fetal thyroid gland.

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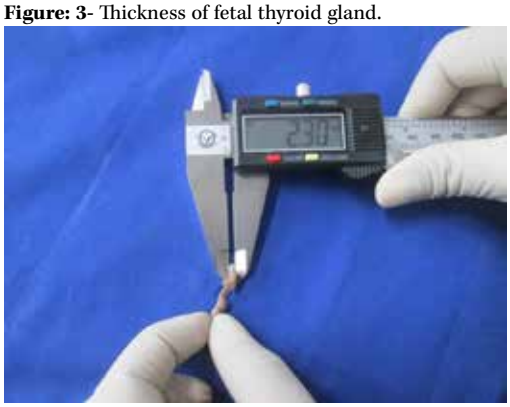
Figure: 3- Thickness of fetal thyroid gland.



Discussion

In present study we observed right and left lobe connected to intervening isthmus in normal thyroid gland. In some tissue we observed persistence of pyramidal lobe which is the caudal end of thyroglossal duct. A pyramidal lobe was found to be present in 55% of the cadavers (6). In a study performed to clarify the morphologic characteristics of the thyroid glands in Koreans the frequency of the existence of the pyramidal lobe was 76.8% (12). Most of the variations of the thyroid gland are due to a partial persistence of the median or thyroglossal duct by Melnick JC et at (6). Some study describe variations and developmental anomalies including partial and total agenesis of the gland, presence of ectopic tissues or accessory thyroids, permanent thyroglossal duct anomalies such as cyst, fistula, sinus, and pyramidal lobe or fibrous band (9). In our study isthmus were present in all thyroid tissue. Many workers claim that the absence of isthmus is quite rare in the human and in adult animals the isthmus is either present or absent (10). The isthmus was missing in four cases of the 58 cadavers studied by Braun et al (1). In our study we observed there were no more difference between dimensions of right and left lobe but dimensions increased as gestational age advanced. In some study incidence of 80% of developmental anomalies showed broader right and left lobes (7).

Conclusion

We observed that the results obtained from this study will be useful in monitoring thyroid glands in the intrauterine period as well as recognizing early diagnosis and treatment of thyroid anomalies. This study revealed that weight and dimensions of fetal thyroid gland increased as gestational age increased. This study gives knowledge of thyroid growth differentiation in different gestational ages. This knowledge will be helpful to judge the thyroid structure in preterm babies.

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