



Original Research Article

Morphometric Study of Human Foetal Testes - Research Article

Gangulappa. D¹, Soma Sekhar.R², Raju Sugavasi³

¹Assistant Professor, Department of Anatomy, Kakatiya Medical College, Warangal- 506007. Telangana, India.

²Assistant Professor, Department of Anatomy, Viswabharathi Medical College, R.T Nagar, Penchikapadu, Kurnool- 518463, Andhra Pradesh. India.

³Assistant Professor, Department of Anatomy, Fathima Institute of Medical sciences (FIMS), Kadapa- 516003. Andhra Pradesh. India.

Corresponding Author: Gangulappa.D

Received: 29/05/2015

Revised: 19/06/2015

Accepted: 22/06/2015

ABSTRACT

One hundred and twenty testes both right and left of different age groups of 60 aborted fetuses with no congenital abnormalities, aged 20 weeks to full term were studied. The gestational age of the fetuses was evaluated by measuring the Crown-rump length.

The testicular dimensions like length (height), width, thickness and weight were assessed. Also the position of testes was observed. The mean length, width, thickness, and weight of the right testes were found to be 0.98 cm, 0.76 cm, 0.55 cm, 0.47 gm. The mean length, width, thickness and weight of the left testes were found to be 0.85 cm, 0.68 cm, 0.50 cm, 0.44 gm. No testes had descended to the scrotum in any fetus until 28 weeks of gestation, variation in position from 29 weeks to 32 weeks and both testes had descended to the scrotum in 33 weeks to full term. The dimensions of the testes are useful in the Prenatal diagnosis of Congenital syndromes and early detection of Cryptorchidism.

Key Words: Testes, Dimensions, Cryptorchidism.

INTRODUCTION

Testes are primary organs responsible for producing sperms which are essential for reproduction and population of species. The testes are derived from three sources of components, the primordial germ cells, the Coelomic epithelium and subjacent mesenchyme of the mesonephric ridge (Hamilton and Mossman).^[1] In the early fetal development of the human, the testes are retroperitoneal, with in the abdominal cavity. With the fetal growth they

migrate from the abdomen towards the scrotum which is attributed to hormonal and mechanical factors. The migration begins at 17 weeks of gestation and accelerates at 24-26 weeks. At 23 weeks most testes are still in the abdomen. At 26-28 weeks the testes pass through the deep inguinal ring and inguinal canal. From 28 weeks the testes pass through the superficial inguinal ring and thence to scrotum. (Moore.K.L., Persaud T.V.N).^[2]

Heyns observed that by 22 weeks of gestation 10% testes are in descent, by 25

weeks 50%, by 26 weeks 75% and by 32 weeks 80%. [3] Sampaio and Favorito observed that all testes were in the scrotum after 30 weeks of gestation. [4] Malas M A observed 48 testes in 24 male fetuses which were obtained after death during the Prenatal period (or) after abortion. In 10 fetuses aged 27-33 weeks four testes were intra abdominal, 3 were between inguinal canal and scrotum and 3 were in the scrotum. The testes of all the fetuses at 33-40 weeks were in the scrotum. [5] Luciano. A. Favarito observed 326 testes from 163 human fetuses aged from 10-35 weeks, 224 were abdominal, 45 were inguinal, 55 were scrotal, 2 were absent [6] Dr. Achiron stated that testicular descent was not observed prior to 25 weeks of gestation, with 30% fetuses having one or both testes descended at 25 weeks and 97% after 32 weeks. [7]

MATERIALS & METHODS

In this study, we examined 120 testes of 60 human fetuses ranging from 20 weeks to full term with no congenital anomalies, which have been collected from Government Maternity Hospital, Hanamkonda and Chanda Kanthaiiah Memorial Maternity Hospital, Warangal in Warangal district of Telangana State. The age of fetuses were calculated from Crown-rump length and weight (before injecting formalin). The fetuses were fixed in 10% formalin for 3 months before the dissection was carried out. The specimens were

divided into 4 groups according to their gestational age, 20-24 weeks group I, 25-28 weeks group II, 29-32 weeks group III, 33 weeks to full term group IV. Normal dimensions of the right and left testes i.e. length, width, thickness, weight and position were recorded by using calipers. The length of the testes was taken as the distance between its superior and inferior poles. The thickness as the maximum diameter.

RESULTS

Observations:

The present study showed that, there was a gradual increase in the weight and the size of the testes in all dimensions as age advanced. Weight of the testes increased with fetal gestational age, but right one was found slightly heavier than the left testes throughout intrauterine life. The mean weight of both the right and left testes were 0.45 gm (Table No.1).

The length of the testes was found to be increasing gradually and uniformly with fetal age between 20 weeks to full term. The mean length of both the right and left testes were 0.91 cm.

The width and thickness of both right and left testes showed gradual increase with fetal age. The mean width and thickness of both the right and left testes were 0.72 cm and 0.52 cm between 20 weeks to full term fetuses. (Table No. 1). There was no significant difference between the dimensions of the right and left testes with any group.

TABLE NO. 1: Showing mean values of various dimensions of the right and left testes in different gestational ages (20 weeks to Full Term (F.T.))

| Age in Weeks | Total no of Fetuses | Length (in cm) | | Width (in cm) | | Thickness (in cm) | | Weight (in gm) | |
|---|---------------------|----------------|------|---------------|------|-------------------|------|----------------|------|
| 20-24 | 14 | 0.45 | 0.44 | 0.65 | 0.59 | 0.44 | 0.41 | 0.38 | 0.37 |
| 25-28 | 13 | 0.82 | 0.70 | 0.75 | 0.62 | 0.56 | 0.49 | 0.42 | 0.39 |
| 29-32 | 12 | 1.18 | 1.04 | 0.82 | 0.73 | 0.59 | 0.52 | 0.49 | 0.46 |
| 33-F.T. | 21 | 1.48 | 1.24 | 0.85 | 0.77 | 0.62 | 0.59 | 0.58 | 0.55 |
| Average dimensions of right to left testes | | 0.98 | 0.85 | 0.76 | 0.68 | .55 | 0.50 | 0.47 | 0.44 |
| Average of (120) total testes | | 0.91 | | 0.72 | | 0.52 | | 0.45 | |

TABLE NO. 2: Showing the testicular location in different gestational ages of 60 fetuses (120 testes).

| Position of the Testes | 20-24 weeks No .of testes | | 25-28 weeks No.of testes | | 29-32 weeks No. of testes | | 33 weeks to Full Term | |
|------------------------|---------------------------|------|--------------------------|------|---------------------------|------|-----------------------|------|
| | Rt | Left | Rt | Left | Rt | Left | Rt | Left |
| Abdominal | 13 | 13 | 8 | 8 | 3 | 3 | - | - |
| Inguinal | 1 | 1 | 5 | 5 | 4 | 5 | - | - |
| Scrotal | - | - | - | - | 5 | 4 | 21 | 21 |

Position of 120 testes in different fetal age groups were observed that 40% (48) were intra abdominal, 17.5% (21) were inguinal canal 42.5% (51) were in scrotum. All testes were in the scrotum after 33weeks of gestation. (Table No. 2) (Fig. 1 & 2).



FIG: 1: Arrow showing 28 weeks of fetal testis in abdomen.



FIG: 2: Arrow showing 28 weeks of fetal testis in abdomen.

DISCUSSION

According to Subhalakshmi Wahengbam and Malas M.A. the dimensions of the testes in fetuses from 9 weeks to 40 weeks were gradual increase in the size as well as weight of the testes with

advancing age. [8] In the present study the dimensions of the testes from 20 to full term was gradual and uniform increase in size with advancing gestational age. Mittwoch reported that the right testes were heavier than the left testes. [9] In present study the right testes is slightly heavier than the left testes. (Table No. 1).

Sampaio observed 74 testes migration from 10 to 40 weeks. According to them at 10 to 23 week 9.45% in inguinal canal, at 24 to 26 weeks 57.9% in inguinal canal, at 27 to 29 weeks 3 testes had not descended into the scrotum. All the testes were in the scrotum after 30 weeks of gestation. Luciano A, favarito observed 32 testes (164 human fetuses) ranging from 12-35 weeks of post conception. 7% were abdominal, 9.4% were inguinal, 19.8% were in scrotum and asymmetry in migration in 9 cases ie. 5.5%. 3 of these 9 were intra abdominal and the other in the inguinal canal. [10] In the present study, the testes were abdominal in 40% (48), in inguinal canal in 17.5% (21), in scrotum in 42.5% (51). All testes were in scrotum after 33 weeks of gestation.

CONCLUSION

The present study was undertaken to know the normal dimensions i.e. Length, Width, Thickness, Weight and position of the testes in fetuses between 20 weeks to full term. The dimensions are useful indicators to assess the growth and maturation of the testes. Knowledge of the variations is helpful in prenatal diagnosis of congenital syndromes and early detection of cryptorchidism.

REFERENCES

1. Hamilton W.J; H.W. Boyd and Mossman's Human embryology. Prenatal development of form and function in the Urogenital system, 4th edi W. Heffer & Sons Lt. London 1972; 337-436.
2. Moore K.L, Persaud T.V.N. The developing human (clinically oriented Embryology) 5th ed : Philadelphia W.B. Saunders & Co. 1993; 265-301.
3. Heyns. C.F. The gubernaculum during testicular descent in human fetus. J. Anatomy 1987; 153: 93-112.
4. Sampaio. F.J.B: Favorito L.A. Analysis of testicular migration during the fetal period in humans. J. Urol 1998; 159: 540-2.
5. M.A. Malas et al. The growth of the testes during the fetal period. B.J. International .1999; 84: 689-692.
6. Luciano. A. Favarito et al. Congenital absence of the testes in human fetuses and cryptorchid patients. Int Jour of Urology. 2004; 11(12): 1110-13.
7. Dr. R. Achiron et al. Development of male gender. Prenatal sonographic measurement of scrotum and evaluation of testicular descent. Ultrasound in obstric & Gynoc. 1998; 11 (4); 242-45.
8. Subhalakshmi Wahengbam et al. Development and Morphogenesis of testes in human fetuses. Jour Anat soc. India. 2011; 60 (2); 160-167.
9. Mittwoch. U. et al. Comparison of development of human fetal gonads and Kidneys, Jour Reprod fertile 1980 : 58 : 463 – 7.
10. Luciano. A. Favorito. Francisco J.B., Sampaio. Testicular Migration Chronology do the right and the left testes migrate at the same time. Analysis of 164 human fetuses. B.J.U. international. 2014; 113 (4); 650 – 3.

How to cite this article: Gangulappa D, Soma SR, Sugavasi R. Morphometric study of human foetal testes - research article. Int J Health Sci Res. 2015; 5(7):146-149.
