

ANTERIOR FONTANEL SIZE

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ABSTRACT

Anterior fontanel size was determined in a cross-sectional study of 445 infants ranging in age from newborn period to 2 years. The mean anterior fontanel size in neonates was 3.37 ± 0.61 cm which decreased to 0.37 ± 0.06 cm in 24 months age group. The age of closure of anterior fontanel was 12, 18 and 24 months in 40%, 70.4% and 91.3%, respectively.

Key words: *Anterior fontanel.*

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Received for publication: December 15, 1992;

Accepted: September 4, 1993

The knowledge of size of anterior fontanel is useful in evaluating the abnormal intracranial situations of failure of calvarial and brain growth. An unusually large or small size of fontanel may be a clue for the identification of intracranial or system disorders(1-4). The present study was conducted to determine the size of anterior fontanel in different age periods from newborn period to 2 years and to find out the age of its closure.

Material and Methods

This cross-sectional study included 445 children between 0-2 years of age belonging to Kanpur, representing a mixed socio-economic strata. The newborn infants included in the study were full term and weighed 2500 g or more. They were examined after 48 hours of birth and at monthly intervals upto 12 months of age. Older infants and children were drawn from Well Baby Clinic of L.L.R. Hospital, Kanpur and their measurements were taken at the age of 15, 18, 21 and 24 months. The time tolerance of ± 15 days was allowed on the day of examination. The infants with history of birth trauma, asphyxia, congenital anomalies, persistent cyanosis, convulsions and systemic illness and eventful perinatal period and cases with protein energy malnutrition (PEM) were excluded.

For measurement of anterior fontanel, the-boundaries were traced by careful palpation of fronto-parietal area in midline. The four points A, B, C and D were marked on the scalp with a sharp point sketch pen, where the boundaries tend to meet at anterior, posterior, left lateral and right lateral angles of fontanel, respectively. Then fontanel anteroposterior diameter or length (AB) and transverse diameter or width (CD) were measured by using the blunt ends of a sliding

caliper in a sitting child whose head and arms were restrained by an attendant. Any fontanel too small to be measured was considered closed. The mean anterior fontanel size was calculated by taking the average of length (AB) and width (CD)(4). The basic data thus obtained were arranged age wise at monthly intervals upto 1 year of age and at 3 months interval for next 12 months, *i.e.*, at 15, 18, 21 and 24 months(4) and mean and standard deviation were calculated. A percentile grid for the size of anterior fontanel at 3 monthly age interval was constructed by applying the method, used by previous workers (5-10).

Results

Out of 445 cases studied, 220 (49.4%) were males and 225 (50.6%) were females.

The majority of the children (92.6%) belonged to socio-economic Classes II, III and IV; 7.4% were from Classes I and V. The mean values for the size of anterior fontanel were in decreasing order with increasing age. Anterior-fontanel was closed as early as 6 months of age in a clinically normal child. By 12 months, it had closed in 40% children. In 91.3% children it had closed before 24 months of age (*Table I*). The mean anterior fontanel size which is maximum in the newborn (2.2 to 4.5 cm) decreases as the age advances; at 24 months its size reduces by 0.25 to 0.5 cm (*Table II & Fig. 1*).

Discussion

The anterior fontanel of the newborn infant may increase in size after birth, but generally diminishes after 6 months(2). In this

TABLE I-Mean Fontanel Size and Percentage of Closure

Age (mo)	Number	Anterior fontanel size (cm)			%
		Mean	±	SD	
Newborn	45	3.37	±	0.61	-
1	24	3.34	±	0.57	-
2	28	3.24	±	0.52	-
3	28	3.18	±	0.60	-
4	20	3.09	±	0.78	-
5	22	2.83	±	0.58	-
6	22	2.64	±	0.51	4.5
7	22	2.65	±	0.58	-
8	25	2.55	±	0.67	4.8
9	30	2.48	±	0.59	6.7
10	23	2.37	±	0.91	8.7
11	22	2.26	±	0.73	22.7
12	20	2.18	±	0.68	40.0
15	32	1.47	±	0.62	56.2
18	35	1.13	±	0.45	71.4
21	24	0.63	±	0.19	83.3
24	23	0.37	±	0.06	91.3

TABLE II-Age-wise Percentile for Mean Anterior Fontanel Size

	Percentile						
	3rd	10th	25th	50th	75th	90th	95th
Newborn	2.22	2.58	2.95	3.37	3.78	4.15	4.51
3	2.05	2.40	2.77	3.18	3.58	3.95	4.30
6	1.68	1.98	2.29	2.64	3.00	3.29	3.59
9	1.37	1.71	2.08	2.48	2.87	3.24	3.48
12	0.90	1.30	1.72	2.78	2.63	3.05	3.45
15	0.30	0.67	1.05	1.47	1.88	2.26	2.63
18	0.28	0.54	0.82	1.13	1.43	1.71	1.97
21	0.27	0.38	0.50	0.63	0.75	0.87	0.98
24	0.25	0.29	0.32	0.37	0.41	0.44	0.48

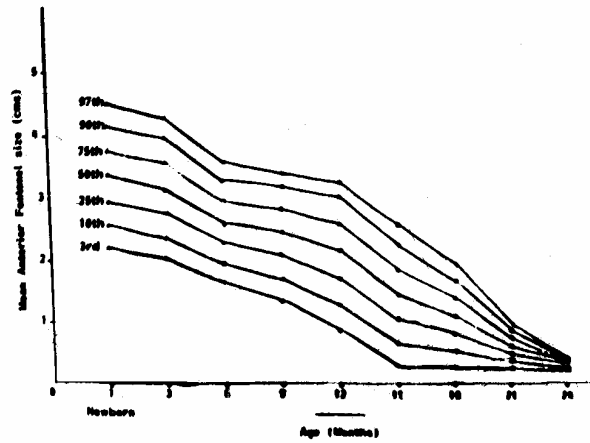


Fig. 1. Age-wise percentiles for anterior fontanel size

study, the mean size of anterior fontanel at different age intervals was higher in comparison to Western(4,6) and few Indian studies(7-8). Our observations are in conformity with few Indian workers(9-10), who also observed higher anterior, fontanel size in their subjects. This may be attributed to regional variations or poor socio-economic status of our subjects indicating general

growth-lag in comparison to their western counterparts. In an Indian study(11), it was reported that there was hardly any patency of anterior fontanel beyond the age of 18 months. Few Western workers(1,12) also mentioned age of closure of anterior fontanel between 9-18 months. This indicates that the closure of anterior fontanel was delayed in our subjects

in comparison to western studies which can be explained by undernutrition prevailing in our subjects. The majority of subjects were having weight between 3rd and 50th percentile for age. However, we had excluded the conditions responsible for large anterior fontanel like rickets, congenital hypothyroidism, mucopolysaccharidoses, prematurity, and intrauterine growth retardation (IUGR) by history, clinical evaluation and anthropometric examination.

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