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Corneal diameter of preterm babies seen at a tertiary hospital in North-Central Nigeria

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Background: Corneal Diameter (CD) is an essential clinical diagnostic and monitoring tool in the practice of paediatric ophthalmology. Measuring corneal diameter is useful in the diagnosis of various corneal diseases. Normative data on our local population of preterm babies is desirable. The aim of this study was to determine the mean corneal diameter in preterm neonates and to correlate it with their birth parameters.

Methods: Healthy preterm babies delivered before 37 weeks of gestational age were consecutively recruited into the cross sectional study after obtaining necessary institutional approvals from Ethics and Research Committee of the Hospital. The babies were laid in supine position to take the measurement of the white-to-white vertical and the horizontal corneal diameters at recruitment in their first week of life and at 40th week post conceptional age (PCA) using the Castroviejo caliper. Statistical analysis was performed using IBM-SPSS-25.

Results: Ninety-six preterm neonates were recruited, 46(47.9%) were males with a male to female ratio of 1:1.1. The range and mean± standard deviation (SD) of birth parameters including the gestational age, birth weight, birth length and occipito-frontal circumference were 26-36 weeks (32.8±2.29), 0.75-2.73kg (1.71±0.41), 32.0-48.0cm (40.66±3.08) and 23.0-34.0cm (30.28±2.52), respectively. In the first week of life, the mean±SD horizontal corneal diameter in the right and left cornea was 8.93±0.51mm and 8.85±0.51mm, respectively (p=0.293). Similarly, the mean±SD vertical diameter in both right and left corneas was 8.85±0.51mm. The values had increased by 40th week PCA. Figure 1 shows the distribution of horizontal corneal diameter in each eye across the different gestational ages at first week of life. There was a strong positive correlation between the corneal diameter and the birth parameters in the preterm babies. (Table I)

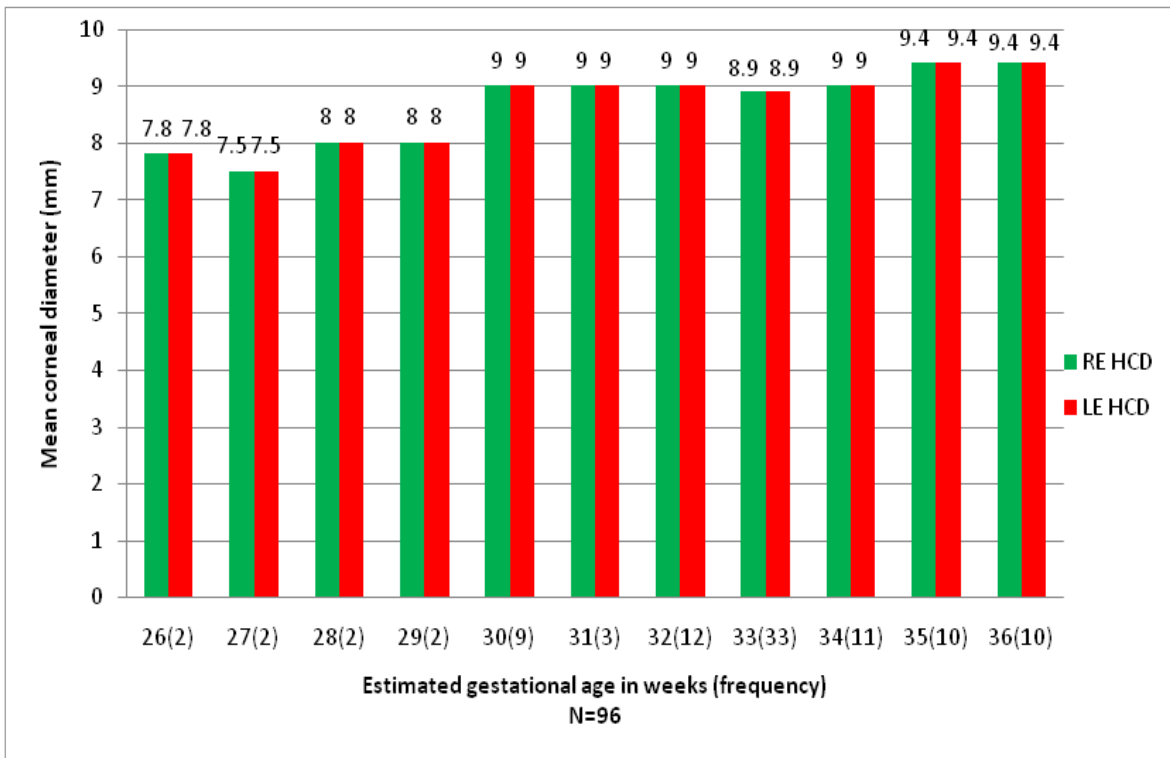


Figure 1: Distribution of horizontal corneal diameter in each eye across the different gestational ages in preterm babies at first week of life

Table I: Relationship between corneal diameter and birth parameters

	Corneal diameters for Preterm in both eyes			
	Vertical		Horizontal	
	(r)	p	(r)	p
BW	0.689	<0.0001	0.653	<0.0001
BL	0.741	<0.0001	0.741	<0.0001
OFC	0.570	<0.0001	0.552	<0.0001
EGA	0.719	<0.0001	0.717	<0.0001

r =Pearson correlation co-efficient, BW= Birth weight, BL= Birth length, OFC= Occipitofrontal circumference, EGA= Estimated Gestational Age

Discussion: The mean horizontal CD of 8.89 ± 0.51 mm in the preterm neonates corroborates the value of 8.90 ± 1.25 mm documented locally by Ashaye *et al*¹ who studied the mean corneal diameter in preterm infants less than 37 weeks of gestation. However, this study was at variance to the study by Sehrawat *et al*² who studied 100 preterm newborns in New Delhi,

India and found a mean value of 8.1 ± 0.6 mm for the corneal diameter in preterm newborns. This may be due to racial and anatomical differences. This study also found a positive correlation between the corneal diameter and birth weight, birth length, gestational age, and occipito-frontal circumference in the preterm neonates. These observations are in keeping with the findings of

Al-Umran et al³ and Choo et al⁴ who found that corneal diameter correlated positively with gestational age, birth weight and head circumference respectively.

Conclusion: This study provides the normative values for corneal diameter in Nigerian preterm babies. These can be used as reference values in their management.

The bars represent the horizontal corneal diameters at different gestational ages. The green bars represent the average right horizontal corneal diameter while the red bars represent the left horizontal corneal diameter. e.g. At 26 weeks, only 2 babies were seen and the average RightHCD was 7.8mm, Left HCD was also 7.8mm. Generally, the average HCD in both eyes increased as the EGA increased.

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Intraocular pressure with rebound tonometer at different gestational ages of preterm African babies

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Background: Normative values of intraocular pressure (IOP) in different ages of children provide an invaluable diagnostic and monitoring tool in the practice of ophthalmology.

Aim: To determine the intraocular pressure values using a rebound tonometer at different gestational ages of preterm african babies and to correlate with the birth parameters.

Methods: A hospital-based cross-sectional study carried out at the University of Ilorin Teaching Hospital, Ilorin, Nigeria. Ethical clearance was obtained from the Ethics and Research Committee of the Hospital while informed and written consent was obtained from individual parents/guardians. The minimum calculated sample size was 96 using Fisher's formula. The babies were recruited consecutively until the desired sample size was obtained. Healthy preterm babies delivered before 37 weeks of gestational age were enrolled in the study in their first week of life while unstable babies, babies with congenital anomalies, or uncertain gestational age were excluded. IOP measurements were taken in upright positions using an Ic100 Model TA011 I-Care tonometer and the average for each eye was recorded. The association between intraocular pressure and birth parameters recorded were evaluated. All measurements were taken by the principal investigator.

Results: Among the 96 preterm neonates were 46 males and 50 females with a male: female ratio of 1:1.1. The mean±standard deviation (SD) and the range of birth parameters were gestational age: 32.8±2.29 weeks, 26-36 weeks; birth weight: 1.71±0.41kg, 0.75-2.73kg; birth length: 40.66±3.08cm, 32.0-48.0cm; and occipito-frontal circumference: 30.28±2.52cm, 23-34.0cm. Figure 1 shows the distribution of mean