ANTHROPOMETRIC MEASUREMENTS OF NEONATES BORN IN PRIVATE AND GOVERNMENT HOSPITALS

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ABSTRACT:

Anthropometric measurements of newborns infants determine the overall foetal development. The present investigation was undertaken to study the anthropometric measurements of neonates born in Private Maternity Hospitals (PMH) and Government Medical Hospitals (GMH). 500 pregnant mothers in the third trimester were selected from private (PMH= 285) and government (GMH= 215) hospitals. Data was collected using questionnaire- cum- interview schedule. Anthropometric measurements viz; birth weight (BW), crown heel length (CHL), head circumference (HC), chest circumference (CC) and mid upper arm circumference (MUAC) were measured by standard techniques within the 24 hours of the birth. The results of the study showed the majority of PMH (55.09%) and GMH (50.70%) mothers delivered male child. The mean BW, CHL, HC, CC, and MUAC of PMH newborns were 2.82±0.37 kg, 49.47±1.13cm, 33.24±1.51 cm, 30.96±1.30 cm and 9.71±1.04 whereas for GMH newborns were 2.51 ± 0.43 Kg, 48.02 ±1.53 cm, 32.45 ±1.57 cm, 30.34 ±1.22 cm and 9.08 ±1.14 cm respectively. All the mean anthropometric measurements of male infants PMH and GMH were significantly (P<0.01) higher than that of female infants. Similarly all mean anthropometric measurements of infants born in private hospitals were significantly (P<0.01) higher than that of born in government hospitals. Per capita income of PMH and GMH infants were found to be positively and significantly (p<0.01) correlated with all neonatal anthropometry.

Keywords

Birth weight, Crown heel length, Head circumference, Chest circumference, Mid upper arm circumference.

INTRODUCTION :

Anthropometric measurements of newborns infants determine the overall foetal development. The dimensions of newborn's body can be basis for

all changes in anthropometric measurements which may be due to various maternal and infantile variables influencing foetal growth [1]. Anthropometry is an effective and frequently performed child health and nutrition screening procedure. The birth size is the result of fetal growth. The fetal growth which commences shortly after conception is largely determined genetically with the modification of this genetic process by the environment [2, 3, 4]. Environmental factors with a known association with birth size are nutrition, smoking, maternal illness and congenital infection. The other risk factors for low birth weight babies such as maternal age, although not themselves environmental factors are strongly influenced by the social environment [5]. In recent years, there has been a considerable interest in using simple anthropometric measures as a proxy for birth weight. In view of the above, the present investigation was undertaken to study the anthropometric measurements of neonates born in private and government hospitals. The attempts were also made to ascertain the sex-wise difference and the correlation of per capita income of family with neonate anthropometry.

MATERIAL AND METHOD :

The study was carried out in the Private Maternity Hospitals (PMH) and Government Medical Hospitals (GMH), Nagpur, Maharashtra, India. 285(PMH) and 215(GMH) pregnant mothers in the third trimester were selected on the basis of purposive sampling. The demographic profile of subjects was collected using questionnaire- cum- interview schedule. The anthropometric measurements viz., birth weight, crown heel length, head circumference, chest circumference and mid upper arm circumference were measured by standard techniques (Jelliffe, 1966). All the measurements were taken within 24 hours after the birth. Data was collected and analyzed using percentage, mean, standard deviation and Z test and correlations coefficient (Garrett, 1969).

RESULT AND DISCUSSION :

Socio Demographic Profile: The mean age of PMH women was 26.26 ± 3.66 years whereas GMH mothers were 24.43 ± 3.24 years. A majority of pregnant women of PMH (44.91%) and GMH (40.47%) belonged to nuclear family. About 52% pregnant women of PMH had small family size whereas about 48% of pregnant women of GMH had 4-6 members in the family. 48.77% and 28.42% pregnant women of PMH were graduate and post-graduate respectively whereas 58.14 % and 17.21 % of pregnant women of GMH had education up to SSC and HSSC respectively. The mean monthly per capita income of pregnant women of PMH was Rs. 2974.45 ± 1963.43 whereas for pregnant women of GMH it was Rs. 678.60 ± 554.25. Sex Wise Distribution of Infants: Sex wise distribution of infants has been presented in Table 1. Data shows that the majority of PMH (55.09%) and GMH (50.70%) mothers delivered male child and PMH (44.90%) and GMH (49.30%) mothers delivered female child. Mean Neonatal Anthropometry: Table - 2 shows that the mean birth weight of male and female newborn of PMH mothers was 2.87 ± 0.36 kg and 2.77 ± 0.37 kg respectively. The mean birth weight of male and female newborns of GMH mothers were 2.57 ± 0.44 kg and 2.45 ± 0.41 kg respectively. The mean crown heel length of male newborns of PMH and GMH were 49.60 ± 1.09 cm and 48.19 ± 1.56 cm whereas that of female newborns was 49.32 ± 1.16 cm and 47.85 ± 1.49 cm respectively. The mean head circumference of male newborns of PMH mothers was 33.55 ± 1.58 cm and female newborns was 32.87 ± 1.33cm. The mean head circumference of male and female newborns of GMH mothers was slightly lower than that of PMH newborns (32.72 ± 1.46 cm and 32.18 ± 1.63 cm respectively). The mean chest circumference of male and female newborns of PMH and GMH mothers were 31.01 ± 1.28 and 30.91 ± 1.33 cm and 30.34±1.24 and 30.34±1.21 cm respectively. The mean MUAC of

newborns of PMH mothers were higher than newborns of GMH mothers. The male and female newborns of PMH mothers had mean MUAC of 9.85 ± 1.04 cm and 9.56 ± 1.01 cm whereas for GMH newborns the mean values were 9.14 ± 1.09 cm and 9.03 ± 1.18 cm respectively. Dhaher and Alshemeri (2008) also reported that the mean birth weight, length and occipito-frontal head circumference (OFC) (male: Female) were 3.301(+/-0.356) Kg: 3.283 (+/- 0.336) kg, 51 cm (+/-1.055): 50.72 cm (+/-0.953) and 34.719(+/-1.1305) cm: 34.621(+/-1.074) cm respectively. The results of the present study further reveals that all the mean anthropometric measurements of male infants were significantly (P<0.01) higher than that of female infants. Similarly anthropometric measurements of infants born in private hospitals were significantly (P<0.01) higher than that of infants born in Government hospitals. The higher anthropometric of neonates of PMH may be due to better financial status of mothers, who could afford better nutritious food than GMH mothers. The results of the present study are similar to those reported by Ahmed et al. (2014) and Dhar et al., 2002. Ahmed et al. (2014) observed that BW, CHL, HC, CC and MUAC were higher in male babies than in female babies whereas Dhar et al., 2002 found that all the mean anthropometric values (except MUAC which was equal) for the male newborns were a bit higher (significant differences were found for birth-weight, head circumference, and crown heel length) than those for the female babies. Correlation Coefficient between Neonatal Anthropometry and Per Capita Income: Amongst the several socio demographic conditions, family income is one of the most important criteria for the antenatal, and postnatal care of pregnant mothers. Hence an attempt was made to ascertain the correlation of sex wise neonatal anthropometry with that of per capita income of family and has been presented in Table 3. Among the PMH infants, only birth weight of female infants were found to be significantly and positively correlated (P<0.01) with per capita income. GMH female

infants BW (p<0.05), CHL (p<0.01), HC (p<0.05), and MUAC (p<0.05) showed significant and positive correlations with per capita income of family. Neonatal anthropometric measurements of male and female infants combined together showed a significant and positive correlations with BW (p<0.01) for PMH infants and BW (p<0.01) HC (p<0.01) and MUAC (p<0.05) for GMH infants. Irrespective of the hospitals the data showed significant correlations (p<0.01) between all neonatal anthropometry and per capita income of families. Parvathiand Begum (2007) also reported the significant association between income and birth weight of neonates.

CONCLUSION :

The study showed significantly higher neonates anthropometry of male and female infants born in private maternity hospitals. The anthropometry of male infants was significantly higher than female infants in both the types of hospitals. The per capita income of family also showed significant and positive correlations with the neonatal anthropometry. It can be concluded from the study that the socio-economic status plays an important role in health status of neonates.

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Table 1: Sex Wise Distribution of Newborns

Sr.No.	Sex	PMH N=285		GMH N=215	
		No.	%	No.	%
1	Male	157	55.09	109	50.70
2	Female	128	44.91	106	49.30

Table 2: Mean Anthropometric Measurements of Neonates Categorized by Sex and Type of Hospitals Born

Anthropometric measurements	Gender	PMH No	PMH Mean ± SD	GMH No	GMH Mean ± SD	Z Value for PMH Vs GMH
Birth Weight (kg)	Male	157	2.87±0.36	109	2.57±0.44	5.83**
	Female	128	2.77±0.37	106	2.45±0.41	6.13**
	Combined	285	2.82±0.37	215	2.51±0.43	8.53**
Z value (male vs. female)			2.25*		2.02*	
Crown heel length (cm)	Male	157	49.60±1.09	109	48.19±1.56	8.08**
	Female	128	49.32±1.16	106	47.85±1.49	8.26**
	Combined	285	49.47±1.13	215	48.02±1.53	11.63**
Z value (male vs. female)			2.02*		1.62	
Head Circumference (cm)	Male	157	33.55±1.58	109	32.72±1.46	4.42**
	Female	128	32.87±1.33	106	32.18±1.63	3.45**
Z value (male vs. female)	Combined	285	33.24±1.51	215	32.45±1.57	5.65**
			3.94**		2.50*	
Chest circumference (cm)	Male	157	31.01±1.28	109	30.34±1.24	4.26**
	Female	128	30.91±1.33	106	30.34±1.21	3.38**
Z value (male vs. female)	Combined	285	30.96±1.30	215	30.34±1.22	5.45**
			0.66		0.00	
Mid upper arm circumference (cm)	Male	157	9.85±1.04	109	9.14±1.09	5.28**
	Female	128	9.56±1.01	106	9.03±1.18	3.6**
	Combined	285	9.71±1.04	215	9.08±1.14	6.36**
Z value (male vs. female)			2.33*		0.66	

*p< (0.05), **p< (0.01)

Table 3: Correlation Coefficients between Per Capita Income and Neonatal Anthropometry

Anthropometric measurements	Gender	PMH No	PMH r	GMH No	GMH r	All	
						No	r
Birth Weight (kg)	Male	157	0.12	109	0.16	266	0.28**
	Female	128	0.24**	106	0.24*	234	0.38**
	Combined	285	0.16**	215	0.20**	500	0.32**
Crown heel length (cm)	Male	157	0.03	109	0.00	266	0.27**
	Female	128	0.13	106	0.25**	234	0.39**
	Combined	285	0.06	215	0.10	500	0.32**
Head Circumference (cm)	Male	157	0.09	109	0.17	266	0.22**
	Female	128	0.13	106	0.24*	234	0.23**
	Combined	285	0.08	215	0.20**	500	0.22**
Chest circumference (cm)	Male	157	-0.01	109	-0.02	266	0.12*
	Female	128	0.12	106	-0.07	234	0.20**
	Combined	285	0.04	215	-0.03	500	0.16**
Mid upper arm circumference (cm)	Male	157	0.02	109	0.15	266	0.21**
	Female	128	0.12	106	0.22*	234	0.23**
	Combined	285	0.05	215	0.17*	500	0.22**

*$p < (0.05)$, **$p < (0.01)$