ORIGINAL PROF-712

BRIGHT WEIGHT OF TERM, APPROPRIATE OF GESTATIONAL AGE NEONATES IN PAKISTAN

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ABSTRACT

Objectives: A step to provide national standard of birth weight of Pakistani neonates. **Design:** A Prospective and comparative study. **Setting:** This study was conducted at Sheikh Zyed, Fatima Memorial, Ganga Ram Hospitals Lahore and Sandeman Civil Hospital Quetta. **Subject & Methods:** 1028 neonates of healthy mothers were weighed. Birth weight was taken with in one hour after birth of naked neonates by means of Tanita baby weighing scale. **Results:** The neonates from mothers belonging to good socio economic status and multiparous mothers were significantly heavier than mothers belonging to poor socioeconomic status and primiparous mothers respectively. Male neonates were significantly heavier than female babies. No effect of high altitude and consanguinity was noticed on birth weight. Birth weight of neonates of present study was equal to Indian neonates but lower than those of Chinese and Malayan living in Singapore, but far away from British Standards. **Conclusion:** Most of our females are unaware of importance of pregnancy, so there is need for improving maternal awareness to take balanced diet, adequate rest, specially during third trimester and suitable interval between successive pregnancies through information campaign by electronic and print media as well as in Maternal and Child Health centers.

Key Words: Neonates, Birth weight, Socioeconomic Status. Consanguinity.

INTRODUCTION

There are many factors which affect birth weight during pre-and post natal life. These are genetic, racial, dietetic, parity, maternal smoking, twinning, hypertension, toxaemia of pregnancy and anaemia. Multiple births are associated with low birth weight[1]. Term infants born at elevation of 9000 feet or more are 346 grams lighter than those born at sea level[2].

A neonate may be appropriate for gestational age, small for gestational age or large for gestational age. Appropriate for gestational age babies have usually no problems. While small or large for gestational age babies are associated with complications[3].

Normal birth weight is different in different countries. In developed countries, standards of birth weight and height are made for their neonates, but in developing countries including Pakistan where nutritional and health facilities are insufficient, normal standards are not yet available, though few reports are present in literature[4,5].

This study was carried out to provide an addition for making normal standard of birth weight of Pakistani neonates, as well as effects of socioeconomic status, neonatal sex, parity, consanguinity and effect of high altitude on birth weight.

MATERIAL & METHODS

Birth weight of 1028 newborn babies were collected from four main hospitals i.e. Sheikh Zayed, Sir Ganga Ram and Fatima Memorial Hospital Lahore and Sandeman Provincial Teaching Hospital Quetta. Babies selected for this study were full term (gestational age 38-42 weeks). Mothers of babies were non smoker and they did not used tobacco in betel or in any other form. They have no any physical disease. Majority of the mothers were booked and they came for ante- natal check up regularly.

Babies with abnormal presentation, instrumental deliveries or congenital anamalies were excluded. Gestational age was calculated from first day of last menstrual period by taking menstrual and obstetrical history as well from their ante-natal check up cards. Mothers of babies registered at Sheikh Zayed Hospital were belonging to good socioeconomic conditions, while mothers registered at Ganga Ram, Fatima Memorial and Civil Hospital Quetta were belonging to lower/poor socioeconomic status. Birth weight was taken with in one hour after birth of naked neonates by means of of Tanita baby weighing scale to the nearest 25 grams. Male and female neonates were studied combined as well as separately. Parity was pooled into primiparous and multiparous catagories. The results were made statistically by using following formulae.

1. Mean

$$x = \frac{\sum xi}{n}$$

Where x is the arithmatic mean, xi is the sum of all the values divided by their number, n.

2. Standard Deviation. (S.D)

$$6 = \sqrt{\frac{\sum (xi - x)^2}{N - 1}}$$

Birth Weight of Term, Appropriate For Gestational Age Neonates in Pakistan.

Where is the standard deviation, $\sum (x1 - x)^2$ isthesum of the squares of the deviation from mean and N is the number of the values.

3. Z test.

The significance of difference between two means was calculated by finding the P value after applying "Z" test.

$$Z = \frac{x_1 - x_2}{\sqrt{\frac{(6)^2}{n_1} + \frac{(6)^2}{n_2}}}$$

Where X_1 and X_2 are the means of two samples and n, and n_2 are the number of observations in each sample.

Percentiles

$$P = L + \frac{C}{F}\left(\frac{Pn}{100 - F}\right)$$

Where P is the percentile, L is the lower class boundry, C is class interval, f is frequency of observed values in the catagory or class, F is cummulative frequency and n is the total number of observed values.

RESULTS

Table-I. Mean birth weight of all four hospitals and comparison among them.

Hospitals	N	Birth weight (g)+S.D
Ganga Ram, LHR	276	3004.3±399.5
Fatima Memorial, LHR	234	3071.7±384.9
Sheikh Zayed, LHR	298	3201±374
Civil Hospital, Quetta	220	3090±388.9

Comparison

Hospital	Level of Significance
Ganta Ram Vs Fatima Memorial	N.S
Ganga Ram Vs Shiekh Zayed	P<0.001
Ganga Ram Vs Civil Hospital	N.S
Fatima Memorial Vs Shiekh Zayed	P<0.001
Fatima Memorial Vs Civil Hospital	N.S
Shiekh Zayed Vs Civil Hospital	P<0.02

The birth weight (Means+S.D) of present study was found 3090.5+414 grams.

The minimum weight noted was 2025 grams and maximum 460 grams, while mean birth weight came 3132.3+411 grams in male neonates. In female neonates the minimum and maximum weight was 2055 grams and 4200 grams respectively with mean 3059.8+372 grams in the present study.

Table-II. Comparison studies of effect of parental consanguinity on the fetal birth weight. (g)

Study	Country Population Studied	Member			Birth Weight (g)				Other factors affecting birth weight allowed for statistical analysis
		Consanguinous	Unrelated	Mean Consanguinous	Mean Consanuinous	Mean Unrelated	Difference consanguiness and unrelated	Significance of difference	
SIBERT	India (Tamil nado)	322	126 UN-52 C1-61 C2-13	196	2731 UN-2650 C1-2794	2834	-103	P<0.01	Term babies included
MORTAN	Japan	75180	C1-2928 C2-2144	70088	C1-3046	3074	-28		Gestational age parity
SCHORK	Japan	2314	230	2084	3099	3091	+8	N.S	Parity sex, maternal paternal age
RAO	India (Tamil Nado)	14243	Rural 2899 Un-1308 C1-1991 C2-590 Urban 1654 UN-371 C1-989 C2-294	4449 4251	2740 2883	2772 2876	-32 +16	N.S N.S	
STATIS	U.S.A (White)	108	63	45	3247	3352	-105	N.S	
PADIAH	India (Andhra Pardesh)	4823	1821	3002	2850	2880	-60	P<0.001	Sex, socioecono mic state
HONEYMAN	U.K Pakistan Muslims	260	C1-122 C2-62	76	C1-3178 C2-3192	3258	-80 -66	N.S N.S	Gestational Age, Sex, Parity, Maternal Height
PRESENT STUDY	Pakistani Lahore and Quetta	1028	C1-352 C2-120	556	C1-3126 C2-3073	3080	+ 46 + 7	N.S N.S	Term babies included

N.S= Not significant, C1=First consin, C2=More distant than first cousin, U.N= Uncle/niece.

Male neonates are significantly heavier than female neonates (P<0.02), Table No; 1 shows the birth weight and the comparison among all four hospitals. No significant difference was found among the neonates

from parents who are first cousins, far cousins or the parents who not related to each other as indicated in Table-II also indicates the findings of other workers. Table-III Shows the present study and the comparison with the studies carried out in other ethnic groups. Comparison of the results of present study with British standard is shown in Table-IV.

Table-III. Birth weight of three ethnic groups of Singapore and comparison with the present study.

Ethinic Group	N	Birth weight (g)-S.D
Chinese	105	3206.3 (381)
Malay	105	3185.5 (438)
Indian	51	3086.9 (303)
Present Study	1028	3090.5 (414)
Comparison		
Present Study Vs Chinese		P<0.001
Present Study Vs Malay		P<0.001
Present Study Vs Indian		N.S

Table-IV. Percentiles of birth weight (g) of male and female neonates of British Standard and of both sexes present study

Male					
	3rd	10th	50th	90th	97th
British Standard	2800	3100	3550	4100	4400
Present Study	2540	2634	3159	3796	3939
Female					
British Standard	2750	3000	3450	3950	4100
Present Study	2536	2621	3118	3458	3900

There was in significant difference in between the birth weight of neonates i.e 3096.4+394.2 born in Lahore (n=808) and born in Quetta (n=220) with birth weight 3092+388.9. Regarding parity, the neonates from multiparous mothers (n=694) have 3138.1+388.5 grams and of primiparous (n=334) have birth weight 3006.8+388 grams.

Neonates from multiparous mothers are significantly heavier than those from primiparous mothers (P<0.001).

DISCUSSION

The mean birth weight of appropriate for gastational age neonates in the present study came out 3090.5+414 grams which was almost similar to Indian neonates but are significantly lower than those of Chinese and Malayam living in Singapore[7] While the weight of our neonates were far away from British standards[6].

This might be due to (alongwith genetic & racial factors) malnutrition and ill health which are more prevalent in our country[8]. This was further proved in our series that neonates born in Sheikh Zayed Hospital Lahore (mothers belonging to good socio economic conditions) were significantly heavier than the neonates born in other three hospitals. In all these three hospitals mothers were belonging to poor/low socio economic conditions.

In present study birth weight in relation to consangiunity was studied in mothers (n=352) of our neonates married with first cousin, with second or third cousin (n=120) and mothers (n=556) were married with persons who were not related to them. In all these neonates, birth weight did not show any significant difference and the findings were similar to other authors[9].

However Honeyman, Sibert and Paddiah found significant difference between neonates of parents having no blood relations and, belonging to each other as first cousins. Male babies were significantly heavier than female neonates. This is due to genetically programmed higher levels testosteron in males[10].

There was insignificant difference in the birth weight born in Lahore and Quetta. This may be due to similarity in dietetic and living standards. The effect of high altitude was not noted in birth weight of neonates born in Quetta, because the height of Quetta from sea level is only 5490 feet[11] and the plasma volume of pregnant mothers is affected, due to lack of Oxygen, at altitude of 9000 feet or more[2] Neonetes of multiparous mothers are significantly heavier than the primiparous.

This is due to the fact that birth weight increases with birth order. The tendency of birth weight to increase with parity is observed throughout the world, in different ethnic groups and in the population with widely varying mean birth weights. This increase, in birth weight is claimed due to progressive enlargement of the uterine blood supply which improves the foetal growth[12].

CONCLUSION

Measurement of body sizes and weight of neonates give clue about intrauterine growth and indicate nutritional status of mother. This study was carried out by assuming that birth weight of our country will differ from other countries due to racial, environmental, genetic factors and parity.

Male neonates and neonates from multiparous mothers were significantly heavier than female neonates and neonates from primriparous mothers respectively. Neonates from Shiekh Zayed hospital were significantly heavier than other three hospitals. No significant difference in birth weight was found among other three hospitals.

No effect of consanguinity was found. Neonates of present study have equal or slightly lower birth weight compared with the neonates of other developing countries, but far away from developed countries like Britain. No significant difference was found in between the birth weight of neonates born in Lahore and Quetta.

REFERENCES

1. Krieger 1. Paediatrics disorders of feeding, nutrition and metabolism. 1sl ed. New York; Wiley Medical Publications,1982; P.P 3,4,88.

2. Unger C, Weiger JK, McCullough RE, Keefer S.Moor LG. Altitude low birth weight and infant mortality in colarado obstet Gynaecol Surv. 1989;44;253-4.

3. Richard EB, Kliegman RM.High risk infants in; Richard EB, Vaughan VC. Nelson text book of Pediatrics 12lh ed. Philadelphia: WB Saunders 1983:354.

4. Hassan TJ, Ibrahim K, Jaffery SA, Saeed M. Maternal characteristics and birth weight. J Pakistan Med Rs. 1987;26 (3); 145-50.

5. Shami SA, Qadeer T, Schmitt LH, Bittles AH, Consanguinity, gestational period and antheropometeric measurements at birth in Pakistan. Ann. Human Biol. 1991; 18(6): 523-7.

6. Tanner JM, White house RH. Growth asssessment chart. 1st ed. London; Castlemead Publications, 1987.

7. Bhan A, Osborn ACV, Huang H.S, Ratnam SS. Neonatal antheropometry in relation to ethnic distribution of birth weight in Singapore. J.Trop Pediatr 1985;31;124-8.

8. Quresh RN Badrudin SH. Nutrition for safe mother hood, Medical Channel, 1998;3 (4)8-9.

9. Honeyman MM, Bhal.L, Marshall. T.wharton B.A. Consanguinity and fetal growth in Pakistani Moslims. Arch Dis child 1987;62:321-5.

10. Naeye RL, Nebiat T. Risk factors in pragnancy and diseases of the fetus and new born. 1Sl ed . Baltimore; Williams and Wilkins 1982;22;57-9.

11. Bartholomew J.The times atlas of the world 7th ed .London ; Times Book Limited, 1985 :31.

12. Seidman D.S, Hadani PE Stereson DK, Slater PE, Harlaps, Gale R.Birth order and birth weight re-examined. Obstet Gynaecol 1988;72; 158-61