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Retrospective Study of Maternal age and Birth Weight in Abubakar Tafawa Balewa University Teaching Hospital (ATBUTH) Bauchi State, Nigeria

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ABSTRACT: A cross-sectional retrospective study was conducted to determine maternal age and birth weight status of the newborn babies from April 26, 2005 to October 13, 2009. A total of 9,647 populations of newborn babies and their respective mother's age were copied into a data sheet form from maternity record of ATBUTH, Bauchi State. This is a hospital located in Bauchi metropolis that serves the needs of individual belonging to the lower socio-economic groups. This study was done to determine the mean birth weight, incidence of low birth weight and sex ratio of live term deliveries at ATBUTH, Bauchi. The mean (SD) maternal age for male and female newborns were 25.56(6.91) and 25.63(6.94) respectively. And for the mean (SD) birth weight was 3.14(0.57) for male newborns and 3.09(0.57) for female newborns. It was found that male infants were 50g heavier than female infants. The present study found that caesarean section (CS) is higher in babies with a mean (SD) birth weight of 3.21(0.66) and above, while spontaneous vaginal delivery (SVD) is at mean (SD) birth weight of 3.11(0.57) among people attending maternity ward of ATBUTH, Bauchi. Furthermore, difference in mean birth weight was statistically significant in case of sex ($p<0.001$). The sex ratio of the present population study was found to be 0.99, which means more female newborns than males. Emphasis on health education and promotion programmers to encourage late (non teenage) motherhood and discourage early pregnancies among individuals and also inform all the women during antenatal visits about the consequences of low birth weight and significance of delivering the babies with normal birth weight is recommended.

Key words: Restropective, Maternal Age, Birth weight, ATBUTH

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INTRODUCTION

Birth weight is one of the important indices in estimating health and the maturity of the newborn which is influenced by maternal factors like, maternal age, parity etc., and as well as the environmental factors e.g. pesticides . It is a well-recognized factor for evaluation of intrauterine growth and development. Extremes of birth weight are of great concern both to the Obstetrician and to the Pediatrician (Afrin, 2002). The differences in low birth weight of African babies when compared to the European babies can be attributed to the unfavorable environment where the Africans live (Swender, 2011). Low birth weight is the important cause of perinatal, neonatal and postnatal mortality and morbidity (Akter, 1999).

Each year about (Olu Dunant, 2005) million infants are born weighing less than 2.5kg (Mahmood, 2004 and Begum et al., 1995). About 95% of them are in developing countries (Bhattacharlee, 1983). An average newborn infant in the developed countries weighs between 3.3kg to 3.5kg; in contrast an average newborn infant in developing countries weighs between 2.5 to 3.1kg (Afrin, 2002). Low birth weight affects about 5 to 6 million children of Nigeria every year. Here the average birth weight is 3.08 to 3.18kg (Pakrasi et al., 1985 and Olu Dunant, 2005).

It is important to note that most of the low birth weight babies are born in lower class group (51.5%) and most of the average weight babies are born in higher class group (88.8%) (Makhija et al., 1990). Incidences are more in primipara and young mothers less than 20 years comprising 57.6%3. The intimate contact between an infant's birth weight and the danger of mortality in the first year of life has been identified, and birth weight is frequently used by researchers as a criterion on mortality risk. At light and heavy birth weights, an infant's risk of dying soars, in recent years, heavier infant birth have become less link with high immortality dangers, perhaps due to medical invention. Very light infants continue to be at great risk of immortality, morbidity (disease) and long-term developmental problem. Variation of average birth

weight have been associated with infant gender, multiple birth factors and maternal factors such as age, race and ethnicity, size, nutrition, current and previous pregnancy, medical risk characteristics.

The infant's health does not only depend on maternal nutrition but also on the infant's long-term growth pregnancy outcome are affected by other factors as well as nutrient intake. These factors are age, occupation, family, pregnancy experiences and morning sickness.

Population with more infants born at very high or low birth weights predictably has higher infant mortality rates. Therefore, it is an established procedure to take birth weight into account when making comparisons of mortality among newborn populations. Whether the comparison involves temporal, geographic, socio-economic, hospital or other contrast, infant mortality differences are typically examined within birth weight categories.

The study on birth weight status of newborn has become essential, as low birth weight babies are very prone to perinatal asphyxia, meconium aspiration. The main causes of death in low birth weight babies are atelectasis, malformation, pulmonary hemorrhage, intracranial bleeding, secondary anorexia or birth trauma, pneumonia and other infections etc. (Chowdhury, 2012). Again birth weight more than 4000gm tends to develop morbidity and mortality.

Large babies are prone to develop multidisciplinary diseases and congenital anomalies. They also have a higher incidence of birth injuries (Afrin, 2002 and World Health Organization, 1984). Through this research study, we want to highlight the present situation of the average well-being of the newborn in Bauchi State, so that it may help the concerned authority to take appropriate measures for improving this condition.

MATERIALS AND METHODS

A cross-sectional retrospective study was conducted from April 26, 2005 to October 13, 2009. Written consents were sent to the CMD through the Chairman and Ethical Research Committee of the hospital to obtain and use their hospital's data. A total of 9,647 population data were collected from hospital's case card delivery (Birth Record Book) in ATBUTH, Bauchi State. Necessary data for the present study were copied into data sheet from the birth registers available in this hospital and cases of birth over a period of five years were taken into consideration. The biological data collected include age of mother at the time of delivery, mode of delivery, sex of the child and birth weight; these are the available variables in their record.

Data entry and statistical analyses was done using Sigma Stat 2.0 for Windows (Systat Inc.; Point Richmond, CA). Difference in the two variables i.e. Caesarean section (CS) and spontaneous vaginal delivery (SVD) were determined using Student t-test, relationship between maternal age (MA) and birth weight (BW) were obtained using Pearson correlation coefficient. Statistical significant difference was deemed acceptable when $p<0.05$.

RESULTS

Of the 9,647 singleton live born babies 4802 (48.8%) were boys and 4846 (50.2%) were girls.

Table 1 presents descriptive statistics for the sample of male and female newborn subjects (Males N= 4802, Females N= 4846). The mean and standard deviation of the anthropometric parameters e.g. maternal age and birth weight were presented as well as the range (min-max), t-value and P-value. The anthropometric parameters showed significant difference with $P<0.001$ in birth weight.

Table 2 presents descriptive statistic for the mean of birth weight according to mode of delivery which shows mean (SD) in caesarean section (CS) for N= 274 and spontaneous vaginal delivery (SVD) for N= 9374 were 3.21(0.66) and 3.11(0.57) respectively with $p<0.005$ for both of the two parameters.

Table 3 presents the correlation matrix of maternal age and birth weight in general population of both male and female newborns (Males N= 4802, Females N= 4846). High statistically significant correlation between maternal age (MA) and birth weight (BW) for male subjects ($P<0.01$) for both male and female subjects.

Table 4 presents predictive equations of birth weight (BW) from maternal age (MA). High statistically significant $P<0.001$ were observed for male subjects and in both male and female subjects together but failed to show significant $P<0.65$ for the female subjects.

Table 1. Mean of maternal age and birth weight in male and female newborns

Parameter	Sex	N	Mean±SD	Range	T	p
Maternal age (Year)	M	4802	25.56±6.91	13.0-60.	0.53	0.60
	F	4846	25.63±6.94	13.0-60.		
Birth weight (kg)	M	4802	3.14±0.57	1.80-6.0	4.2	<0.001
	F	4846	3.09±0.57	1.80-6.0		

Table 2. Mean of birth weight according to mode of delivery

Parameters	N	Mean±SD	t	P
Caesarean Section	274	3.21±0.66	2.83	<0.005
Spontaneous Vaginal D.	9374	3.11±0.57		

Table 3. Correlation matrix of maternal age and birth weight

Parameter	Males (n=4802)		Females (n=4846)		Males + Females (n=9647)	
	MA	BW	MA	BW	MA	BW
Maternal age	--	0.07**	--	-0.006	--	0.03*

Table 4. Predictive equations of birth weight from maternal age

Sex	N	Predictive Equations	SEE	R	R^2	T	P
Males	4802	BW=2.99 +(0.006×MA)	0.57	0.07	0.005	5.11	<0.001
Females	4846	BW=3.11-(0.00053×MA)	0.57	0.006	0.00042	99.7	<0.65
M+F	9647	BW=3.05+(0.00273×MA)	0.57	0.03	0.0011	3.26	<0.006

DISCUSSION

The last half-century has witnessed many changes in the reproductive habits of population, the technologies and management of child birth. The present study showed that the mean birth weight of male and female newborn babies were 3.14kg and 3.09kg respectively. In the previous study from4 reported that mean birth weight was 2572gm in Bangalee new borns. Several studies relating the effect of mother's age and parity on birth weight indicate that parity is more important factor of the two (Khanam, 1995, Karn, 1951 and Makhija, 1990). A possible explanation of lower birth weight among first born infants could be a consequence of biological immaturity as compared to later-born infants.

It is now universally acknowledged that maternal age is an important factor influencing the incidence of LBW. Moreover, the rate of LBW decreases significantly with the increasing age of mother after 18 years of age. In present study, the higher incidences of LBW rate were observed mother's age less than 19 years. Earlier studies have also reported that the young (<20 years) mothers had higher incidence of LBW than older (<30 years) mothers (Begum et al., 1995 and Oni, 1986).

In the present research study, the mean maternal age of both the sexes were in normal range but showed no significant $p<0.60$ between the male and female newborns. Earlier study also has been showed that the normal age range of a mother to be given normal birth weight were 21-30 years (WHO database on LBW, 1992). Also the mean birth

Weight is normal in both the male and female newborns since the normal range of birth weight was 2500gm to 3500gm (WHO database on LBW, 1992). But it was significantly higher in male than in female newborns and is compatible with the results from other conducted research.

A bivariate analysis showed that maternal age, sex of the newborn, mother's education, parity, family income and ethnic groups all had a significant influence on birth weight. The results of the present study also confirm the findings from other studies, that male babies were generally heavier than the female babies (Millis, 1954). Most studies have documented a tendency of increasing birth weight with maternal age (Khanam, 1995 and Makhija). Similar findings have been obtained in this study.

The correlation confident of maternal age and birth weight are related to fetal growth in general. This study also showed that the mean of birth weight according to mode of delivery is higher in caesarean section 3.21(0.66) than in spontaneous vaginal delivery 3.11(0.57) and this was due to the fact that caesarean section often occur in babies with higher birth weight hence the mean birth weight was higher than normal delivery (SVD).

The sex ratio of the present population study have been found to be 0.99, which means that female newborn were higher in number than male newborn babies and this might be due to environmental factors and infanticide.

CONCLUSION

This study revealed some hidden facts and information on maternal age and birth weight; the conclusion which can be inferred from the findings of the present study, is that teenage pregnancies should be actively discouraged in this hospital or the state in general so as to reduce the incidence of LBW. The concerned authorities should formulate appropriate health awareness and health promotion programmers to encourage late (non-teenage) motherhood and discourage early pregnancies among individuals. Effective implementation of such programmers would be beneficial in reducing the rate of LBW among people of Bauchi State.

Hospitals management should please be serious on keeping the necessary parameters (data record) for its importance to research study. Further studies are needed to fully understand the confounding factors responsible for early motherhood. Lastly, studies similar to the present one should be undertaken among various other hospitals in Nigeria.

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