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Research Article

Maternal Health Status and Birth Weight of the Newborn

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Abstract

A large number of under 5 mortality due to acute respiratory infection is preventable and treatable.

Keywords: Risk Factors; Under 5 Children; Respiratory Problems; Bangladesh

Introduction

Childbirth is the momentous both for women and men [1]. Maternal and child health care is one of the important challenges of global health issues. The maternal health status have been considered an important indicator of pregnancy prognosis, of birth conditions, especially those related to birth weight and perinatal mortality [2]. Several factors like pre-pregnancy body mass index (BMI) and gestational weight gain influence the newborn birth weight and play significant roles in adverse pregnancy outcomes. Birth weight plays an important role in infant mortality and morbidity, child development, and adult metabolic diseases [3,4].

Bangladesh is a developing country with an area of 1,47,570, sq. km a total population of 137.44 million, GNI per capital is 380 (US$), infant mortality rate 54 per 1000 live birth, percentage of low birth weight is 30%, total fertility rate is 3.7, maternal mortality ratio is 3.50 some of its problems are low birth weight, high infant mortality and maternal mortality, all of them are responsible for an extra burden on health services as well as on country's development.

This study was an attempt to find out the interface between adequacy of gestational nutritional status and some maternal characteristics with birth weight.

Methodology

This cross sectional study was conducted among 83 randomly selected mother attended in MCH hospital of Azimpur, Dhaka city for delivery to see the maternal characteristics and birth weight of newborn during December 2017. An interviewer administered semi-structured questionnaire was used to collect socio-demographic and occupational information. Anthropometric measures of the both respondents and subjects were accomplished according to the WHO recommendations [5] and using particular instruments following standard procedure [6]. Statistical analysis was performed by using window based computer software devised with Statistical Packages for Social Sciences (SPSS-17) and Microsoft Office Excel 2007. Non parametric parson's chi-square test was done with probability value <0.05 considering level of significance at 95% confidence limit. Approval from ethical review committee of the NIPSOM was taken. Verbal Informed consent was obtained from each respondent before the interview and hearing tests. Respondent's rights of refuse and withdraw.

Results

Majority of the respondents (44%) were in the age group of 21 - 25 years, followed by 28% were within 26 - 30 years, 25% were of up to 20 years of age. By level of education, 23% had H.S.C. level of education, 22% had Primary (i-v) level of education and same

number of respondents had secondary (vi-x) level, 17% S.S.C, 4% illiterate, 12% Graduate or above level of education. Among respondent's husband 8.4% were illiterate, 18.1% had primary (i-v) level of education, 12.0% secondary (vi-x) level another 12.0% had S.S.C level, 16.9% had H.S.C. level and 32.6% had graduation and above level of education. Majority of the respondent's occupation was housewife (74.7%) followed by job holders (15.7%). Among the respondent's husbands, majority (57.8%) were service holder and 38.6% were businessman. Majority of the reported children's family were nuclear 55.4% and rest were joint type. The mean household monthly income of the reported families was 15277.11 ± 10200.8 BDT. Among the respondents, majority 79.5% resided in urban area, followed by 16.9% in rural area and rest 3.6% resided in semi-urban area. Majority of dwelling house was pacca 55 (90.4%).

Characteristics	Frequency (%)
Age	
17-20 years	21(25)
21-25 years	36(44)
26- 38 years	23(28)
Mean	24.22 ± 4.15 years
Education	
Illiterate	3(4)
Primary level (class I-V)	18(22)
Secondary level	
(Class VI-VIII)	18(22)
SSC	14(17)
HSC	20(23)
Graduate or above	10(12)
Husband's Education	
Illiterate	7(8.4)
Primary (i-v)	15(18.1)
Secondary (vi-x)	10(12.0)
S.S.C	10(12.0)
H.S.C.	14(16.9)
Graduation and above	27(32.6)
Occupation	
Housewife	62(74.7)
Job Holder	13(15.7)
Garments worker	8(9.6)
Husband's occupation	
Service Holder	48(57.8)
Business	32(38.6)
Others	3(3.6)
Family type	
Nuclear	46(55.4)
Joint	37(44.6)
Monthly family income in BDT	
Less than10000	34(40.9)
10001-20000	38(45.8)
More than 30000	11(13.3)
Mean	15277.11±10200.8 BDT
Residence	
Urban	66(79.5)
Semi-urban	3(3.6)
Rural	14(16.9)
Type of house	
Pacca	75(90.4)
Semi pacca	5(6.0)
Kaccha with Tin roof	3(3.6)

Table 1: Socio-demographic distribution of the respondents (n=83).

Characteristics	Frequency (%)
Blood Group	
A+ve	27(32.5)
B+ve	27(32.5)
AB+ve	10(12.1)
O+ve	19(22.9)
Anemia	
Mild	47 (56.6)
Moderate	32 (38.6)
Secondary level	
(Class VI-VIII)	18(22.0)
Severe	4(4.8)
Weight	
Up to 50 kg	15 (18.1)
51 - 60 Kg	47 (56.6)
Over 60 kg	21(25.3)
Mean 57.151 ± 7.9801 kg	
Height	
Up to 155 cm	72 (87)
Over 155 cm	11 (13)
Mean 152.83 ± 2.994 cm	
BMI	
15.1-20	5(57.8)
20.1-25	55 (38.6)
25.1 and above	23(3.6)
Mean 24.3936 **±** 3.07719	

Table 2: Distribution of respondents by physical status.

Among the respondents 32.5% possessed A+ve, 32.5% B+ve, 12.1% AB + ve and 22.9% possessed O+ group. By anemia majority 56.6% respondents had mild type anemia, followed by 38.6% had moderate type and rest 4.8% had severe anemia. By weight majority 56.6% respondents had 51 - 60 Kg, followed by 25.3% had more than 60 kg and rest 18.1% had up to 50 kg. By height it was found that majority 87% had up to 155 cm and 13% had more than 155 cm. Among the total respondents majority 66.3% had BMI within 20.1-25, followed by 27.7% had 25.1 and above and rest 6% had BMI within 15.1-20.

Gravida	Alive child				Death baby
	1	2	3	4	
1 (41.0)	33	0	0	0	
2 (36.1)	3	27	0	0	
3 (13.3)	1	5	5	0	1
4 (4.8)	0	0	2	2	
5 (4.8)	0	0	0	4	
Total	37	32	7	6	

Table 3: Distribution of respondents by Obstetric history (n=83).

The table shows that among the respondents majority 41% were primi gravid, followed by 36.1% had second time pregnant, 13.3% were third time, 4.8% were fourth time and rest, 4.8% were fifth time pregnant. The table also showed that the entire baby was alive in the time of study except one who was third time pregnant.

Gestational age	Frequency	Percent (%)
More than 37 weeks	52	62.7
Less than 37 weeks	7	8.4
37 weeks	24	28.9
Total	83	100.0

Table 4: Distribution of respondents by Gestational age (n=83).

By gestational age majority 62.7% of the respondents had more than 37 weeks when she admitted in the hospital for delivery, followed by 28.9% had 37 weeks and rest 8.4% had less than 37 weeks.

Characteristics	Frequency (%)
Sex of subjects	
Male	48(57.8)
Female	35(42.2)
Newborn condition	
Normal	69(83.1)
Asphyxiated	12(14.5)
Infection	2(2.4)
Birth Weight	
up to 2.4 kg	4(4.8)
2.5 - 3.0 kg	51 (61.4)
Over 3 Kg	28 (33.8)
Mean 2.9 ± 4563 Kg, Minimum 1.5 kg and Maximum 3.9 kg.	
Birth Height	
Up to 50 cm	72(86.7)
Over 50 cm	11 (13.3)
Occipito frontale circumference (OFC)	
Up to 30 cm	5(6.0)
Over 30 cm	78 (94.0)
Mean 32.21 ± 1.156cm, Minimum 27 cm and Maximum 35 cm	
Chest circumference	
Up to 30 cm	16 (19.3)
Over 30 cm	67 (80.7)
Mean 31.17 ± 1.447cm, Minimum 24 cm and Maximum 34 cm	

Table 5: Characteristics of Newborn (n=138).

In this study, the number of boys was higher than the girls (57.8% boys and 42.2% girls), majority 83.1% were normal, followed by 14.5% were asphyxiated and 2.4% had puerperal infection. By birth weight majority 61.4% baby had between 2.5 - 3.0 kg birth weight, followed by 33.8% had more than 3.1 kg and rest 4.8% had low birth weight (up to 2.4 kg). By birth height majority 86.7% baby had Up to 50 cm and rest 13.3% had more than 50 cm birth height. Among the babies majority 94% had OFC more than 30 cm while only 6% had OFC less than 30 cm. majority 80.7% had chest circumference more than 30 cm while 19.3% had chest circumference less than 30 cm.

Weight of mother	Birth weight of newborn			Test of significant
	up to 2.4 kg	2.5 - 3.0 kg	more than 3.1 kg	
Up to 50 Kg	2	13	0	χ^2=13.70
51 - 60 Kg	0	27	20	p=.008
More than 60 kg	2	11	8	

Table 6: Distribution of respondents by Weight of mother and Birth Weight of newborn.

Table shows that those mothers who had weight 51 - 60 Kg delivered healthier newborn than those mothers who had weight less than 50 Kg. Statistically it was found significant (p>0.05). That

means there is an association of increased weight of mother during pregnancy with increased weight of new born.

BMI of Mother	Birth Weight of Baby			Test of significant
	up to 2.4 kg	2.5 - 3.0 kg	more than 3.1 kg	
15.1-20	2 (50.0%)	3 (5.9%)	0 (0.0%)	$_{x}^{2}$= 18.57 p= .001
20.1-25	0 (0.0%)	36 (70.6%)	19 (67.9%)	
25.1 and above	2 (50.0%)	12 (23.5%)	9 (32.1%)	

Table 7: Distribution of respondents by BMI of Mother and Birth Weight of new born.

The above table shows that the mother who had the BMI within 15.1-20 delivered 50% of the child having birth weight up to 2.4 kg and 5.9% of baby having birth weight 2.5 - 3.0 kg. On the other hand those who had the BMI within 20.1-25 delivered 70.6% of the child having birth weight 2.5 - 3.0 kg and 67.9% of the child having birth weight more than 3.1 kg. Statistically it was found significant (p>0.05), that means there is an association between BMI of Mother and increased birth weight of baby.

Discussion

This cross-sectional study was conducted among 83 randomly selected mother attended in a MCH hospital of Dhaka city, the capital and largest city in Bangladesh to see the maternal characteristics and birth weight of their newborn baby. Majority of the respondents 44% were in the age group of Age 21 - 25 years, followed by 28% were with in 26 - 30 years, majority 79.5% resided in urban are, followed by one sixth (16.9%) in rural area. Among the respondents majority's (90.4%) were living in pucca house. By level of education 23% had H.S.C. and followed by 22% Primary (i-v) and same proportion had SSC level of education. By monthly income, a major part of the respondents (45.8%) had 10001 - 20000 Taka followed by one third (32.5%) had 5001 - 10000 Taka. By blood group more than one third (32.5%) respondent possessed of A+ve and B +ve and by anaemia more than half (56.6%) had mild type anaemia, followed by about forty percent (38.6%) had moderate type and 4.8% had severe anaemia. By weight more than half (56.6%) had 51 - 60 Kg, followed by one fourth (25.3%) had more than 60 kg. and by height majority (86.7%) had up to 155 cm. And 13.3% had more than 155 cm. Among the total respondents majority (66.3%) had BMI within 20.1-25. Baqui and associates found mothers' mean weight, height, MUAC and BMI were 41.8 kg, 148.8 cm, 232.5 mm, and 18.8 respectively [7]. Among the respondents forty percent (41%) were primi gravid, followed by 36.1% had second time pregnant and 13.3% were third time, 4.8% were fourth time and rest 4.8% were fifth time pregnant.

About sixty percent (57.8%) of newborn baby were male in our study which was similar to some studies in Bangladesh [8,9]. majority (83.1%) were in normal condition and one sixth (14.5%) were asphyxiated. By birth weight more than sixty percent (61.5) baby had within 2.5 - 3.0 kg birth weight and 4.8% had low birth weight less than 2.5 kg). And by birth height majority (86.7%) baby had Up to 50 cm, 94% had OFC more than 30 cm, majority (80.7%) had chest circumference more than 30 cm.

The study observed that the mothers who had weight 51 - 60 Kg delivered healthier newborn than those mothers who had weight less than 50 Kg. and the mothers who had BMI within 15.1-20 delivered 50% of the low birth weight child. Statistically both were found significant (p>0.05), that means there is association between weight and BMI of Mother and increased birth weight of baby. Study by Elshibly and Schmalisch also found significantly correlated (p = 0.002) maternal height with gestational age. Maternal age and all maternal anthropometric measurements were also positively correlated (p < 0.001) with birth weight. The researchers concluded that birth order and maternal height were found to be the most important maternal parameters which influence birth weight and the risk for LBW [10].

Conclusion

The current study concluded that majority of newborn baby were in normal condition with an alarming part were asphyxiated. Among the babies delivered, more than sixty percent had birth weight between 2.5 - 3.0 kg and about one fifth had low birth weight (less than 2.5 kg). The study is also revealed that the mothers who had weight within 51 - 60 Kg delivered healthier newborn than those mothers who had weight less than 50 Kg and the mothers who had BMI within 15.1-20 delivered 50% of the low birth weight child. Statistical significant association between higher weight and BMI of Mother with increasing birth weight of newborn were reported. Attempt to make nutritional assistance as part of prenatal care is recommended.

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