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Neonatology

Maternal Sociodemographic and Clinical Characteristics Associated with Intrauterine Growth Restricted Infants

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Abstract		Original Research Article

Objective: To evaluate maternal sociodemographic and clinical characteristics associated with intrauterine growth restricted infants. ***Methods:*** This case control study was conducted at BSMMU, Dhaka from August 2015 to July 2016, where 98 newborns in the NICU during study period were the study population. All the IUGR babies were labeled as case (Group- A), n=49 and the babies of the same gestational age were labeled as control (Group-B),n=49. After taking consent from parents/Guardians, particulars of the neonates, antenatal, natal and postnatal history were recorded in a data collection form. The sociodemographic and clinical characteristics were identified by taking face to face interview of mother regarding prenatal period. Data were analyzed by statistical package for social sciences (SPSS) version 20. Risk factors were analyzed to calculate the odds ratio. Then risk factors were analyzed with chi square test to find out significant risk factors. P values less than 0.05 (95% CI) were considered statistically significant. ***Result:*** During the study, maternal weight (p=<0.001), height (p=<0.001), socioeconomic status of mother (p=0.001), ANC visit (p=<0.001), Inter pregnancy Interval (p=0.04) were found statistically significant. Placental insufficiency (p=0.001) and Pregnancy Induced hypertension (p=0.001) were significantly associated with IUGR. ***Conclusion:*** From our result, we can conclude that, maternal weight, height, inter pregnancy interval, socioeconomic status, Pregnancy induced hypertension, placental insufficiency, and less ANC visit were contributing factor for IUGR babies.
Keyword: Intrauterine growth restriction, placental insufficiency, Inter pregnancy Interval.

INTRODUCTION

Intrauterine growth restriction (IUGR) is one of the major public health issues in developing countries like Bangladesh. It may be defined as the rate of fetal growth that is subnormal form the perspective of the growth potential of a specific infant according to race and gender [1]. Some authors defined it as the weight of the fetus below the 10th percentile of appropriate gestational time and gender [2]. IUGR has got significant importance due to its approach towards post neonatal, infant and childhood mortality and morbidity [3].

IUGR incidence is singleton pregnancies is 3-7%.4 Among them IUGR infants are frequently observed in Asian continent accounting for approximately 75% of all affected infants[1]. Bangladesh claimed the highest rank in the statistics of IUGR babies in Asian continent [5].

IUGR may be caused by maternal, placental or fetal factors individually or altogether. Nearly one third of this problem may be due to genetic causes and rest two-third are due to fetal environment [6]. Among them elderly age of mother, inter-pregnancy interval, mothers

health status, behavioural status and maternal infection are significant maternal risk factors [7]. Besides, the imbalance between supply of nutrient by the placenta and the demand of fetus is a significant fetal risk factor. Besides, congenital malformation, inborn error of metabolism and chromosomal mismatched conditions are also vital risk factors for IUGR [7]. Recently, it was claimed that maternal, fetal and placental genes polymorphisms are also accounted as risk factors for IUGR with the radical advancement of molecular biology and genetics [8].

In this study our main goal is to evaluate the maternal sociodemographic and clinical characteristics associated with intrauterine growth restricted infants.

OBJECTIVE

General objective
- To evaluate the maternal sociodemographic characteristics associated with intrauterine growth restricted infants.

Specific objective
- To identify clinical characteristics of mothers associated with IUGR babies
- To detect socioeconomic condition of mothers associated with IUGR babies

Methodology

Type of study	Case control study
Place of study	BSMMU, Dhaka.
Study period	August 2015 to July 2016
Study population	98 newborn in the NICU during study period were the study population. All the IUGR babies were labeled as case (Group- A),n=49 and the babies of the same gestational age were labeled as control (Group-B),n=49
Sampling technique	Purposive

METHOD

During the study, after taking consent from the parents/guardians, particulars of the neonates, and antenatal, natal and postnatal history were recorded in a data collection form. The sociodemographic characteristics were identified by taking face to face interview of mother. Maternal weight was taken by digital weight machine [SALTER], height was measured by stediometer and BMI was calculated by weight in kg divided by height in square meter. The infant's medical records were reviewed and were recorded in a data collection form. Here the mothers whose antenatal records properly maintained were included in the study. Information from ultrasonography report during pregnancy was collected. Placental insufficiency was confirmed by Doppler ultrasonography. Clinical examination was done to search for any congenital anomalies, neurologic and metabolic abnormalities. The newborn infants were weighed without clothing soon after birth on an electronic scale (infant-type) with a precision of 10 g [Model 914, SALTER].

The OFC of the infant was taken by measuring tape& length was taken by infantometer, expressed as centimeter. Gestational age was calculated on the basis of ultrasonography findings and New Ballard scoring. Newborns were classified as appropriate for gestational age and IUGR when their birth weight was respectively between the 90th and 10th percentiles and less than the 10th percentile of the weight for gestational age from the Lubchenco chart.

DATA ANALYSIS

After collection, data were entered into a personal computer and were edited, analyzed, plotted in graphs and tables. Data were analyzed by Chi square test, Mann Whitney U tests, using the statistical package for social sciences (SPSS) version 20. Contributing factors were analyzed to calculate the odds ratio and then were analyzed with chi square test to find out significant factors. P values less than 0.05 (95% CI) were considered statistically significant.

RESULT

In Table-1 Shows age distribution of the patient's mother where there is a no difference between case group and control group. The following table is given below:

Table-1: Age distribution of the patients mother (n=98; 49 in each group)
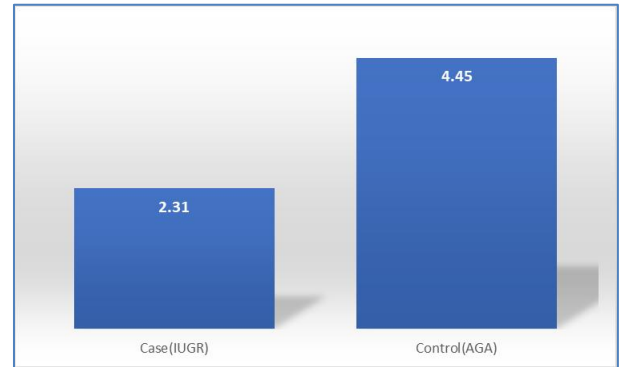
Characteristic	Case (IUGR) (n=49)	Control (AGA) (n=49)	P-value
Maternal age (year)	24.09±5.1	23.33±5.03	0.25[NS]

In Figure-1 Shows age distribution of the patientsmother where most of the mother in both group belong to 20-34 years age group. The following figure is given below in detail:
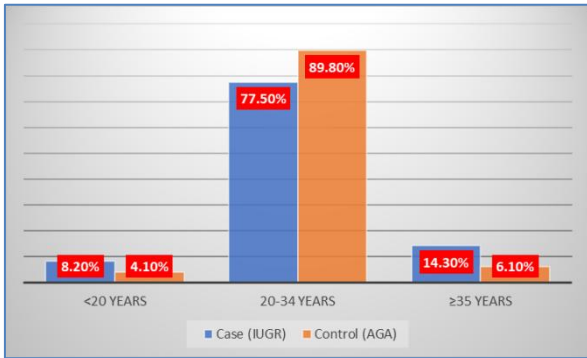
Fig-1: Age distribution of the Patients mother

Fig-2: Total ANC visit of the Patientsmothers associated with IUGR babies

In Figure-2 Shows total ANC visit of the patientsmothers associated with IUGR babies where in case group mean ANC visit was 2.31 ±1.45 whereas in control group it was 4.45±1.45. The following figure is given below in detail:

In Table-2 Shows parity distributions where most of the patients mother in both group belong to parity 1. The following table is given below in detail:

Table-2: Parity distribution of the patient'smother

Parity	Case	Control	OR (95% CI)	P value
1	29 (59.2%)	32 (65.3%)	0.97 (0.61-1.62)	0.43 [NS]
2	15 (30.6%)	14 (28.6%)	1	
≥3	5 (10.2%)	3 (6.1%)	1.81 (0.68-4.61)	

In Table-3 Shows maternal sociodemographic characteristics associated with IUGR babies where in both group most of the patients mothers Inter pregnancy interval was 24-48 months. The following table is given below in detail:

Table-3: Maternal Sociodemographic characteristics associated with IUGR(n=98; 49 in each group)

Characteristics	Case (IUGR) (n=49)	Control (AGA) (n=49)	OR (95% CI)	P-value
Maternal weight				
≤45 kg	25 (51%)	12 (24.5%)	4.94 (2.65-9.21)	<0.001 [S]
45-55 kg	16 (32.7%)	20 (40.8%)	2.07 (1.12-3.82)	
≥55 kg	8 (16.3%)	17 (34.7%)	1	
Maternal height				
≤1.45 meters	26(53.1%)	5(10.2%)	11.09 (5.23-23.56)	<0.001 [S]
1.46-1.55 meters	15(30.6%)	31(63.3%)	1.05 (0.56-1.86)	
>1.55 meters	8(16.3%)	13(26.5%)	1	
BMI (kg/m2)				
<18.5	8(16.3%)	7 (14.3%)	0.92 (0.52-1.66)	0.14 [NS]
18.5-24.99	32(65.3%)	35 (71.4%)	1.95 (0.86-4.42)	
≥25	9(18.4%)	7 (14.3%)	1	
Inter pregnancy interval				
<24 months	14 (28.6%)	9 (18.4%)	2.69 (1.17-6.13)	0.04 [S]
24-48 months	18 (36.7%)	27 (55.1%)	1	
>48 months	17 (34.7%)	13 (26.5%)	2.14	

| | | | (1.02-4.56) | |

In Figure-3 Shows socioeconomic status of mothers where most of the patients in both group belong to lower economic status, the following figure is given below in detail:
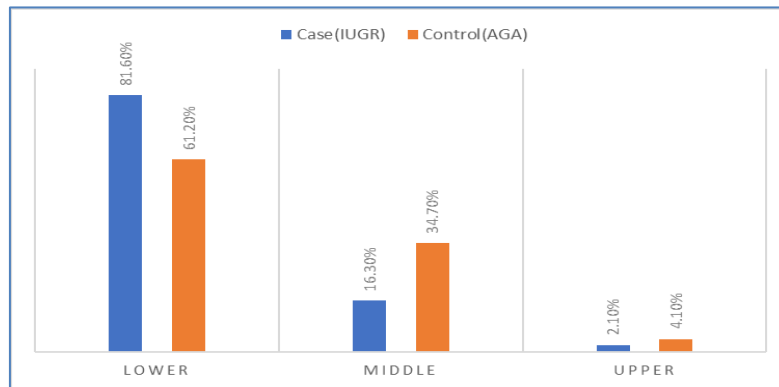

Fig-3: Socioeconomic status of mothers associated with IUGR babies

In Table-4 Shows clinical characteristics of mothers associated with IUGR babies where most of the patients in both group, in case group 53.1% patients had Placental Insufficiency where as in control group it was 6.1%. The following table is given below in detail:

Table-4: Clinical Characteristics of mothers associated with IUGR babies (n=98; 49 in each group)

Characteristics	Case (IUGR) (n=49)	Control (AGA) (n=49)	OR (95% CI)	P-value
Placental Insufficiency				
Yes	26 (53.1%)	3(6.1%)	16.99	<0.001[S]
No	23 (46.9%)	46 (93.9%)	(4.67-61.87)	
Previous IUGR				
Yes	5 (10.2%)	1 (2.1%)	5.47	0.09[NS]
No	44 (89.8%)	48 (97.9%)	(0.61-48.51)	
Pregnancy Induced HTN				
Yes	24 (49%)	8 (16.3%)	4.85 (1.89-12.38)	0.001[S]
No	25(51%)	41 (83.7%)		
OR: Odds ratio P-value was calculated by chi-square test S: significant NS: Not significant				

In Figure-4 Shows maternal Chronicmedical illness where in case group it was 28.6% where as in control group it was 14.3%. The following figure is given below in detail:
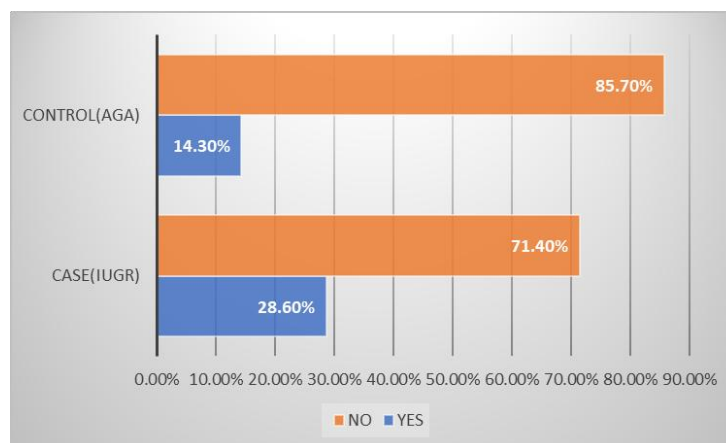

Fig-4: Maternal Chronic medical illness

DISCUSSION

According to the study of Singh *et al.* [9] LBW was significantly associated with total number of ANC visit. Current study also showed that less ANC visit was significantly associated with higher incidence of IUGR. In this study previous history of growth restriction was not significantly related with IUGR. But it was found significant by Thompson *et al.*[10] and Sharon and Gilberto11. IUGR babies were more frequently observed among the poor socioeconomic background. Several studies also revealed similar result [12-14]. In this study maternal age of mother of IUGR babies were notstatistically significant (P=0.25) which is consistent with studies conducted by Mavalankar *et al.* [14] and Fikree *et al.*[15]. Butin contrast, Yadav *et al.*[16] and H.S. Joshi *et al.* [17] found more risk of delivering IUGR babies by teenage mothers. Maternal weight was significantly associated (P = <0.001) with the birth weight of the baby which is consistent with Ehrenberg *et al.* [18].

Maternal height has got significant association with IUGR in this study like Singh *et al.* [9] but it differs with another studyOjha and Malla [19]. Placental insufficiency was recognized as a risk factor (p=0.001) in this study, as it was also mentioned by H. S. Joshi *et al.* [17] and Krishna Usha *et al.* [20]. Pregnancy induced hypertension was found as risk factor (p=0.001) for IUGR which was also found significant by Victoria M Allen *et al.* [21] Inter pregnancy interval showed significance (P=0.04) in contributing as a risk factor for developing intrauterine growth restriction which was similar with Yadav *et al.* [16] and in contrast with Roy *et al.* [22].

CONCLUSION

From our study we can conclude that maternal weight, height, inter pregnancy interval, lower socioeconomic status, less ANC visit, pregnancy induced hypertension and Placental insufficiency were contributing factor for Intrauterine growth restriction.

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