Intrauterine Growth Restriction and Antenatal Care in Urban Rajshahi, Bangladesh

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Abstract

Background: Intrauterine growth restriction (IUGR) is characterized by a rate of growth in the fetus that is below the expected level based on the growth potential of that particular newborn. IUGR is a significant contributor to both fetal and neonatal morbidity and mortality. This syndrome arises from a variety of factors, like low maternal weight, smoking, inadequate prenatal care, pregnancy-induced hypertension (PIH) etc. **Objective:** The aim of this study was to find out the relationship between IUGR and ante natal care among the urban women. **Methods:** This study employed a cross-sectional design to investigate pregnant women residing in urban regions of Rajshahi district. A purposive sample of 150 individuals was selected from both the outpatient department and indoor facilities of Barind Medical College Hospital, Rajshahi. **Results:** A total of 150 pregnant mothers, 29 (19.3%) mothers delivered newborns with IUGR and 120(80%) mothers received regular antenatal checkup. In this study, 56 (37.3%) mothers had high blood pressure and among them 42 (75.0%) received antihypertensive drugs. IUGR were significantly ($p<0.05$) heigher among the mothers had not received ANC than the mothers had received ANC. **Conclusion:** Intrauterine growth restriction (IUGR) is one of the major public health issues in Bangladesh. Practice of regular antenatal care should be strengthened in Bangladesh.

Key words: intra uterine growth restriction (IUGR), antenatal care (ANC), Bangladesh.

Introduction

When a neonate's rate of fetal development is lower than the typical foetal growth potential, or when the foetus does not attain its full potential for growth, this condition is referred to as intrauterine growth restriction (IUGR).

An newborn with birth weight or birth length below the 10th percentile, either during the prenatal period or after delivery, is referred to as tiny for gestational age.[1,2] IUGR is typically diagnosed during the antenatal period, although it can also be identified in newborns immediately after birth using clinical examination, anthropometry index, and clinical assessment

of nutritional status (CAN) score.[3-6] Intrauterine growth restriction (IUGR) is a significant public health issue, impacting around 10-15% of expectant mothers. Twenty-three point eight percent of newborns are found to have IUGR.[7]

Obstetricians and perinatologists must prioritize screening for neonatal unfavorable delivery outcomes, such as intrauterine growth restriction (IUGR). Reason being that it has an effect that is linked to hypoxia at delivery, poor neurodevelopment, and perinatal morbidity and mortality. It also manifests as metabolic syndrome in adults. Consequences include both immediate and delayed health problems, as well as a considerable increase in the 10th percentile or lower for newborn length, weight, and head circumference. As a major issue in poor nations, IUGR ranks second in perinatal death, behind only preterm.[8]

An IUGR fetus has a significantly higher risk, around five to ten times greater, of experiencing intrauterine death, resulting in a range of 23 to 65 stillbirths. Approximately 50% of the premature stillbirths and 25% of the full-term stillbirths were characterized by growth retardation. In developing nations, the occurrence of intrauterine growth restriction is mostly caused by a combination of variables involving the fetus, placenta, and mother. However, the maternal factors are the most significant contributors to this condition.[9,10]

This study is crucial for determining the correlation between intrauterine growth restriction and antenatal care (ANC), in Bangladesh.

Methods

This descriptive cross-sectional study was conducted at the indoor and outpatient departments (OPDs) of Barind Medical College Hospital in Rajshahi, Bangladesh.

All urban pregnant mothers of the Rajshahi district attending at Barind Medical College Hospital at 3rd trimester of their pregnancy were the study population. A total of 150 pregnant mothers were selected purposively in the study as sample units from the study population. Data were collected by face to face interview with a help of a partially structured questionnaire designed to record the information on IUGR as well as the respondents' socio-demographic and biological traits. IUGR was detected by ultrasound. A female doctor was present at all times when data was being collected. Ethical Committee, Institute of Biological Sciences, Rajshahi University gave its stamp of approval to the study's protocol before it ever began. Prior to commencing the study, the necessary approvals were obtained from the relevant authorities at Barind Medical College Hospital in Rajshahi. Data obtained were analyzed in a computer using the statistical package for social science version 23. Chi Square test was applied to determine the association between the variables.

Results:

A total of 150 pregnant mothers, 29 (19.3%) mothers delivered newborns with IUGR and 120(80%) mothers received regular antenatal checkup. A total of 150 respondents, 118(78.8%) respondents were Muslim, 29(19.3%) were Hindu and the rest 3(2.0%) were Christian. It was found that 59.3% were graduates, 10.7% had post graduate degree, 26.0% had undergraduate degree and 4.0% were illiterate. More than 47% of the respondents were house wife. Majority (77.3%) of the respondents had monthly family income >40000Tk.

Out of 150 mothers, 56(37.3%) had high blood pressure (BP) and among them 42(75.0%) took anti HTN drug and 14 (25.0%) did not take any medicine though all were advised for medication. It was found that 11.3% had history of convulsion, 46.7% took rest 10 hours per day and 18.0% had family history of IUGR (Table I).

Table I: Sociodemographic and clinical characteristics of the respondents.

Variables		Frequency N	Percentage %
Religion	Islam	118	78.1
	Hindu	29	19.3
	Christian	3	2.0
Educational status	Illiterate	6	4.0
	Undergraduate level	39	26.0
	Graduated	89	59.3
	Post Graduate	16	10.7
Occupation	House wife	71	47.3
	Service Holder	79	52.7
Monthly family income	<10000 Tk	1	0.7
	10000-20000 Tk	6	4.0
	21000-40000 Tk	27	18.0
	>40000 Tk	116	77.3
Type of family	Joint	77	51.3
	Nuclear	73	48.7
No. of pregnancy	Primigravida	42	28.0
	Multipara	108	72.0
Regular Ante natal checkup	Yes	120	80.0
	No	30	20.0
High BP	Yes	56	37.3
	No	94	62.7
Taking Anti HTN drug n=56	Yes	42	75.0
	No	14	25.0
Weight of last child	<2.5 Kg	29	19.3
	>2.5 Kg	121	80.7
History of convulsion during pregnancy	Yes	17	11.3
	No	133	88.7
Drug for systemic disorder	Yes	11	7.3
	No	139	92.7
10 hours rest per day	Yes	70	46.7
	No	80	53.3
Family history of IUGR	Yes	27	18.0
	No	123	82.0

A total of 120 pregnant mothers, who had received regular ANC, only 2 (1.7%) mothers delivered a baby with IUGR. But IUGR was significantly ($p<0.05$) high (90.0%) among the mothers who hadn't received ANC (Table II). Percentages of the pregnant mothers, who received ANC, were gradually increased with increasing the pregnant mothers' educational status. It was statistically significant ($p<0.05$) (Table III).

Table II: Association between antenatal care and intrauterine growth restriction.

Received ANC	IUGR		Total N (%)	χ^2= 120.07, df = 1, p<0.01
	Had N (%)	Hadn't N (%)		
Yes	2 (1.7)	118 (98.3)	120(80.0)	
No	27 (90.0)	3 (10.0)	30 (20.0)	
Total N (%)	29(19.3)	121(80.7)	150 (100.0)	

Table III: Association between educational status and antenatal care

Educational status	Received regular ANC		Total N (%)	χ^2= 26.27, df = 3, p<0.01
	Yes N (%)	No N (%)		
Illiterate	2 (33.3)	4 (66.67)	6 (4.0)	
Undergraduate level	23 (59.0)	16 (41.0)	39 (26.0)	
Graduate	80 (89.9)	9 (10.1)	89 (59.3)	
Post Graduate	15 (93.8)	1 (6.2)	16 (10.7)	
Total N(%)	120 (80.0)	30 (20.0)	150(100.0)	

Discussion:

Intrauterine growth retardation (IUGR) represents the second leading cause of perinatal morbidity and mortality. A major portion of these morbidity and mortality may be prevented by receiving proper prenatal care, and close antenatal surveillance of high risk pregnancy.[11] The findings of the present study also agreed with this hypothesis.

In a study in Ethiopia, it was found that 38.4% of respondents had post-secondary education.[12] It is consistent with the findings of the present study. Tesfa et al. (2019)[12] in Ethiopia observed that more than half (51.3%) of respondents in their study were in the middle class, and less than a quarter (23.7%) of the participants were in the upper class. In the present study, it was inversed, more than three quarters (77.3%) of the respondents were in the upper class. It may be due to variation of economic status of countries' people.

Low birth weight is one of the primary causes of child mortality and several diseases of future

life in developing countries, especially in Bangladesh. According to the Bangladesh Demographic and Health Survey, 2017–18, the average percentage of low birth weight in Bangladesh was 14.27%.[13] But According to the world bank report 2022 it was 23% in Bangladesh.[14] There was a wide rang of low birth weight prevalence rate in Bangladesh. According to Alam et al.(2022)[15] LBW rates were inequitably distributed across the country, with a higher concentration of LBW infants among mothers living in the lowest wealth quintile (poorest). They also revealed that maternal age, area, maternal education level, wealth index, height, age at 1st birth, and the child's aliveness (alive or died) at the time of the survey were important determinants of this variation. The prevalence of LBW among the present study population was 27.3%, it is quite higher than average rate. It may be due to the high prevalence of the determining (risk) factors in the study area. The results of the present study regarding the LBW should not be generalized, used prudently for the other population.

For the purpose of preventing intrauterine development retardation, it is extremely important to increase placental weight and decrease small for gestational age. This can be accomplished by the use of supplementary nutritional supplementation during pregnancy, mainly due to the fact that IUGR/SGA will be significantly reduced when the maternal weight increases. As a result of the fact that education is the fundamental hub of information, the government ought to prioritize providing at least primary education for girls. It is the responsibility of health professionals, including health extension workers, to provide women with counseling regarding the significance of birth intervals (interpregnancy intervals), nutrition, and the provision of health care for women prior to conception (preconception care) and during pregnancy (antenatal care follow up). Additionally, nutritional intervention may be able to assist in increasing maternal weight, which in turn may reduce the risk that is attributed to intrauterine growth restriction (IUGR). It is imperative that medical professionals pay particular attention to pregnant women, particularly with regard to their weight (after the weight gain that occurs during each trimester of pregnancy). In order to optimize maternal systemic diseases and identify the modifiable risk factors, obstetricians and perinatologists need to be able to distinguish the fetus(es) that are at risk of intrauterine growth restriction (IUGR).

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