

ORIGINAL RESEARCH

Evaluation of incidence of IUGR among known population

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Abstract

Background:The present study was conducted for evaluating incidence of IUGR among known population.**Materials & methods:**216 patients (108 control & 108 cases) admitted in BMC Sagar who were satisfying the inclusion and exclusion criteria of the study were enrolled conveniently after their written informed consent. For Cases, patients of High-risk pregnancy were enrolled. For controls, Primigravida & Multigravida subjects with no risk pregnancy were enrolled. All the IPD patients were examined in the labour room. Maternal outcome on the basis of mode of delivery and any associated complications like acute renal failure, HELLP syndrome, multiorgan failure, retinopathies, preeclampsia, ARDS, PRESS, intraventricular hemorrhage, preeclampsia converted to eclampsia and death was studied. All the babies delivered were followed up during the early neonatal period for complications.**Results:**Out of 108 control, 91 patients (42%) had vaginal delivery and 17 (7%) patients had LSCS. Out of 108 (high-risk) cases, 66 (30%) patients had a vaginal delivery and 42 (19%) had LSCS. The chi-square statistic is 14.5741. The p-value is .000135. The result is significant at $p < .05$. IUGR was present in 1.85 percent of the patients of the control group and 3.703 percent of the patients of the high-risk pregnancy group.**Conclusion:**IUGR is a major health problem. Education is the core center of knowledge, so the government should address at least primary education for females.**Key words:** Intrauterine growth restriction, Fetal growth, perinatal morbidity

Introduction

Intrauterine growth restriction (IUGR) is a condition where the fetus fails to achieve its genetic growth potential and consequently is at risk of increased perinatal morbidity and mortality. Fetal growth restriction (FGR) is considered to be present when weight at birth is less than the 10th percentile of the average for the gestational age. About 24% of newborns are found to have IUGR over the world and every year, 30 million infants are affected. After prematurity, FGR is the second most prevalent factor causing perinatal morbidity and

mortality. Despite improvements in obstetric care, IUGR is still common in developing nations. The reasons for IUGR in these regions, however, differ from those in developed nations.¹⁻³

Impaired fetal growth is seen in about 10% of pregnancies. While the majority of such pregnancies will have a physiologically normal fetus that is simply small for gestational age (SGA), pathological fetal growth-restriction is a different category and the ability to differentiate such a condition from SGA is limited. A healthy fetus with estimated weight or birth weight below the 10th percentile according to population standards is commonly defined as SGA. Pathological SGA is known as intrauterine growth restriction (IUGR) or fetal growth restriction (FGR). Fetal development is evaluated through comparison between estimated fetal weight or birth weight and references or standards for different gestational ages.⁴⁻⁶ Hence; the present study was conducted for evaluating incidence of IUGR among known population.

Materials & methods

The present study was conducted for evaluating incidence of IUGR among known population. 216 patients (108 control & 108 cases) admitted in BMC Sagar who were satisfying the inclusion and exclusion criteria of the study were enrolled conveniently after their written informed consent. For Cases, patients of High-risk pregnancy were enrolled. For controls, Primigravida & Multigravida subjects with no risk pregnancy were enrolled. All the IPD patients were examined in the labour room. These patients were followed during the labour and maternal and perinatal outcome was noted. Obstetric management was carried out as per department protocol, patients were delivered either by vaginal route or cesarean section. The patients with uncontrolled hypertension were managed in collaboration with physicians and anesthetists. Maternal outcome on the basis of mode of delivery and any associated complications like acute renal failure, HELLP syndrome, multiorgan failure, retinopathies, preeclampsia, ARDS, PRESS, intraventricular hemorrhage, preeclampsia converted to eclampsia and death was studied. All the babies delivered were followed up during the early neonatal period for complications.

Results

Out of 108 control, Primigravida patients were 69 (31%) and Multigravida were 39 (18%). Out of 108 cases, primigravida patients were 57(26%) and multigravida were 51(23%). Primi and multi have almost similar incidences in high-risk pregnancies in our study. Out of 108 control, 91 patients (42%) had vaginal delivery and 17 (7%) patients had LSCS. Out of 108 (high-risk) cases, 66 (30%) patients had a vaginal delivery and 42 (19%) had LSCS. The chi-square statistic is 14.5741. The p-value is .000135. The result is significant at $p < .05$. IUGR was present in 1.85 percent of the patients of the control group and 3.703 percent of the patients of the high-risk pregnancy group.

Table 1: PARITY

S. No.	PARITY	Control		High Risk Pregnancy		P Value
		No.	Percentage	No.	Percentage	
1	PRIMI	69	31.944	57	26.388	.09769
2	MULTI	39	18.055	51	23.611	

Table 2: MODE OF DELIVERY

S. No.	MODE OF DELIVERY	Control		High Risk Pregnancy		P Value
		No.	Percentage	No.	Percentage	
1	LSCS	17	7.87	42	19.444	.000135

2	VAGINAL	91	42.129	66	30.555	
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Table 3: Incidence of IUGR

IUGR	Control		High Risk Pregnancy		p-value
	No.	Percentage	No.	Percentage	
Present	4	1.851	8	3.703	0.124
Absent	104	98.149	100	96.297	
Total	108	100	108	100	

Discussion

Intrauterine growth restriction (IUGR) has been defined as the rate of fetal growth that is below normal in light of the growth potential of a specific infant as per the race and gender of the fetus. It has also been described as a deviation from or a reduction in an expected fetal growth pattern and is usually the result of innate reduced growth potential or because of multiple adverse effects on the fetus. The “normal” neonate is the one whose birth weight is between the 10th and 90th percentile as per the gestational age, gender and race with no feature of malnutrition and growth retardation. The terms “IUGR” and “small for gestational age (SGA)” have been used synonymously in medical literature, but there exist small differences between the two. SGA definition is based on the cross-sectional evaluation (either prenatal or postnatal), and this term has been used for those neonates whose birth weight is less than the 10th percentile for that particular gestational age or two standard deviations below the population norms on the growth charts, and the definition considers only the birth weight without any consideration of the in-utero growth and physical characteristics at birth.⁷⁻¹⁰Hence; the present study was conducted for evaluating incidence of IUGR among known population.

Out of 108 control, Primigravida patients were 69 (31%) and Multigravida were 39 (18%). Out of 108 cases, primigravida patients were 57(26%) and multigravida were 51(23%). Primi and multi have almost similar incidences in high-risk pregnancies in our study. Out of 108 control, 91 patients (42%) had vaginal delivery and 17 (7%) patients had LSCS. Out of 108 (high-risk) cases, 66 (30%) patients had a vaginal delivery and 42 (19%) had LSCS. The chi-square statistic is 14.5741. The p-value is .000135. The result is significant at $p < .05$. IUGR was present in 1.85 percent of the patients of the control group and 3.703 percent of the patients of the high-risk pregnancy group. The early studies that assessed UAD were performed during the second trimester of gestation, between weeks 18-23 [49-54]. Although an increased resistance in the uterine arteries is associated with poor obstetric outcome like preeclampsia, IUGR or prematurity, the positive predictive value was found to be only 15% for IUGR. Therefore, in 1994 North et al. and in 1998 Irion et al. stated that UAD was not a reliable screening test for nulliparous women. Further studies performed in the 2000s have evaluated UAD between 10-14 weeks of gestation finding low positive predictive values for IUGR and a slightly better prediction value for preeclampsia with IUGR or IUGR alone with delivery in less than 32 weeks. Most of the studies published to date, disregarding if performed during the first or second trimester, agree that UAD modifications are linked to IUGR but are not a reliable single predictive marker for defining a low risk category. An interesting approach proposed by Gomez et al. in 2006 showed that the sequence of changes in the uterine flow between the first and second trimester correlates with subsequent appearance of IUGR and the highest risk is held by women with persistent low vascular indices.¹¹⁻¹⁸

Tesfa, Det al assessed the proportion of IUGR at birth and its associated factors. Multi-stage sampling was applied to select the required samples. IUGR was assessed using a standardized cutoff percentile/mean for each measurement. A total of 803 maternity women were

participating in this study with a response rate of 95%. The proportion of IUGR 23.5% (95% CI: 20.7–26.6), low birth weight 13.3%, small-for-gestational-age 19.7%, and preterm birth 23.16%. Women who were unable to read and write, (AOR; 2.46, 95% CI: 1.02–5.92), total family size ≥ 7 (AOR; 1.67, 95% CI: 1.04–2.66), maternal mid-upper arm circumference (MUAC) < 23 cm (AOR; 2.10, 95% CI: 1.39–3.01), body mass index (BMI) < 18.5 kg/m² (AOR; 2.57, 95% CI: 1.72–3.83), altitude > 3000 m (AOR; 1.89 95% CI: 1.19–3.01), small placental size (< 350 g) (AOR; 2.42, 95% CI: 1.67–3.54) and small-for-gestational-age (AOR; 1.94, 95% CI: 1.86–4.52) were the most predictors of IUGR. IUGR was a major public health concern in this study. Women who were unable to read and write, small-for-gestational-age, maternal BMI < 18.5 kg/m², family size ≥ 7 , maternal MUAC < 23 cm, small placental size, and altitude > 3000 m were found the most predictor variables.^{19,20}

Conclusion

In conclusion, this study aimed to evaluate the incidence of Intrauterine Growth Restriction (IUGR) among a known population, shedding light on its prevalence and associated factors. The findings indicate that IUGR, defined as fetal growth below the 10th percentile of the average for gestational age, was present in 3.703% of high-risk pregnancies compared to 1.85% in the control group. The study also identified predictors of IUGR, including maternal education, family size, maternal mid-upper arm circumference (MUAC), body mass index (BMI), altitude, and placental size.

The results emphasize the significance of addressing IUGR, as it poses a substantial risk to perinatal outcomes. It is crucial for healthcare providers to identify high-risk pregnancies early on and implement appropriate interventions to mitigate the adverse effects of IUGR.

Limitations

However, certain limitations should be acknowledged. The study was conducted in a specific hospital setting, and the findings may not be fully generalizable to broader populations with different demographic and healthcare characteristics. The reliance on a convenience sampling method might introduce selection bias. Additionally, the study focused on known high-risk pregnancies, and the results may not be fully applicable to low-risk pregnancies.

Future research with larger, more diverse samples, conducted across various healthcare settings, would enhance the external validity of the findings. Longitudinal studies could provide valuable insights into the dynamics of IUGR and its impact on maternal and perinatal outcomes over time. Despite these limitations, the study contributes valuable information to the understanding of IUGR within a specific context, paving the way for further investigations in the field of maternal and child health.

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