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Original Research Article

## Study of fetomaternal implications in intrauterine growth restriction pregnancies

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### ABSTRACT

**Background:** Fetal growth restriction (FGR) is a pathological condition in which a fetus has not achieved its genetic growth potential. FGR incidence is 6 times higher in underdeveloped and developing countries as compared to the developed world.

**Methods:** This is a retrospective study done in the department of obstetrics and gynaecology, civil hospital and B. J. Medical college, Ahmedabad over the period of 6 months from December 2022 to May 2023. A total of 30 cases of intrauterine growth restriction (IUGR) pregnancies were studied.

**Results:** Majority of the study population, 60% belonged to younger age group of 20-30 years. Multiparity was associated with IUGR babies. Majority of patients i.e. 76.66%. Presented at gestational age of  $\geq 37$  weeks and 23.33% at  $< 37$  weeks. Most IUGR babies (73.33%) had a birth weight between 2 to 2.5 kg. One third of babies required NICU admission while the perinatal mortality was 10%. Doppler changes in umbilical artery were noted in 27% of cases of IUGR. Among risk factors anemia, preeclampsia and oligohydramnios had equal contributions at 10% each. Previous history for SGA baby is a significant association in 16% of cases. Induction of labor was done in 60% cases, 63% were delivered vaginally and rest via lower segment caesarean section (LSCS), the most common indication of LSCS was fetal distress.

**Conclusions:** The study concluded that IUGR continues to be one of the major etiological factors for fetal morbidity and mortality and increase in rates of LSCS contributing maternal morbidity. IUGR was commonly observed in multigravida patients lacking antenatal care. Anemia and hypertensive disorders of pregnancy as well as oligohydramnios are the potential risk factors for IUGR.

**Keywords:** FGR, IUGR, Perinatal morbidity, Lower segment caesarean section

### INTRODUCTION

Fetal growth restriction (FGR) is a pathological condition in which a fetus has not achieved its genetic growth potential. FGR incidence is 6 times higher in underdeveloped and developing countries as compared to the developed world. IUGR incidence in newborns would be between 3% and 7% of the total population. Statistically defined as an estimated fetal weight (EFW) or abdominal circumference (AC)  $< 10^{\text{th}}$  centile or  $> 2$  SD below the

mean. Severe FGR is defined as EFW or AC  $< 3^{\text{rd}}$  centile.<sup>1</sup> Clinically, FGR is suspected when maternal weight remains static in the 3<sup>rd</sup> trimester and/or fundal height lags gestational age by 4 weeks. FGR is the 2<sup>nd</sup> primary cause of perinatal mortality and accounts for 30% of still-births. Risk factors include maternal age, smoking, substance abuse, daily vigorous exercise, previous FGR, previous stillbirth, diabetes with vasculopathy, renal impairment, chronic hypertension, antiphospholipid antibody syndrome (APLA), heavy 1<sup>st</sup> trimester bleeding, severe

PIH, APH, low maternal weight gain.<sup>2</sup> Incidence is more in developing countries because illiteracy, lack of health awareness, poverty and superstitious belief prevents women from seeking medical advice during pregnancy. Neonatal complications are metabolic, thermal, and hematological disturbances leading to morbidities such as low Apgar score, hypoxia and the need for respiratory support, hypoglycemia, hypothermia, necrotizing enterocolitis (NEC), sepsis, hyperbilirubinemia, prolonged neonatal intensive care unit admission and perinatal mortality.<sup>3</sup>

**METHODS**

This is an observational study done in the department of obstetrics and gynecology, civil hospital and B. J. medical college, Ahmedabad (tertiary medical centre) over the period of 6 months from Dec 2022 to May 2023. A total of 30 cases of IUGR pregnancies were studied. Inclusion criteria: Pregnant female with antenatal USG scan indicating IUGR i.e. <2.5 centile growth with respect to abdominal circumference, calculated by software developed by WHO fetal growth calculator based on the standard fetal growth charts (<https://srhr.org/fetalgrowthcalculator/#/>)V.1.3.0/2023.4.5 -implemented by Medscale Tecnologia © 2023.<sup>4-6</sup> Late FGR or IUGR pregnancies, i.e. gestational age >32 weeks. The case records of 30 cases of IUGR pregnancies were reviewed. Parameters collected with regard to maternal age, parity, gestational age were made. Mode of delivery, birth weight of baby maternal associated risk factors and perinatal outcomes were also studied. Associated factors like maternal age, anemia, oligohydramnios, doppler changes and high blood pressure were studied.

**RESULTS**

During the study period, out of all women who attended the obstetrics department of civil hospital Ahmedabad for delivery, 30 women were diagnosed with having IUGR.

**Table 1: Age distribution.**

Age (in years)	N	Percentage (%)
<20	3	10.0
20-25	10	33.3
25-30	10	33.3
30-35	3	10
35-40	2	6.60
>40	2	6.60

By analyzing sociodemographic characteristics, it was observed that maximum of the study population i.e. 60% belonged to the age group of 20-30 years. And 13% belonged to high-risk age group of 35 and more.

This Table 2 demonstrates that cases of IUGR were commonly seen in multigravidae patients 60%. Among those, majority of the patients were G2 (second gravida) (30%) followed by G3 (16.66%).

**Table 2: Gravida status.**

Primigravida	N	Percentage (%)	
	12	40.00	
Multi gravida	G2	9	30.00
	G3	5	16.66
	G4	3	10.00
	G5	0	0.00
	G6	1	3.33

Table 3 shows that the majority of patients 23 (76.66%) presented at gestational age of ≥37 weeks and 7 (23.33%) at <37 weeks.

**Table 3: Gestational age.**

Age (in weeks)	N	Percentage (%)
32-37	7	23.33
≥37	23	76.66

Table 4 demonstrates that most of the babies with IUGR had birth weight between 2 to 2.5 kg which were 22 (73.33%) of the total cases.

**Table 4: Birth weight.**

Birth weight (in kg)	N	Percentage (%)
<1.5	2	6.66
1.5-2	6	20
2-2.5	22	73.33

Six babies had some perinatal morbidity and required NICU admission while the perinatal mortality was ten percentages.

**Table 5: Neonatal outcome.**

Variables	N	Percentage (%)
NICU admission	6	20
Perinatal mortality	3	10

Doppler changes in the umbilical artery were noted in 27% of cases of IUGR. Among risk factors anemia, preeclampsia and oligohydramnios had equal contributions at 10% each. Previous history of SGA babies is a significant association in 16% of cases.

**Table 6: Risk factors.**

Risk factors/ associated factors	N	Percentage (%)
Preeclampsia	3	10.00
Anemia	4	13.33
Doppler changes in umbilical artery	8	26.66
Oligohydramnios	3	10.00
Previous history of SGA (small for gestational age) baby	5	16.0

Induction of labour was done in 60% cases, 63% were delivered vaginally and rest via LSCS.

**Table 7: Mode of delivery.**

Variables	N	Percentage (%)
Vaginal delivery	19	63.3
LSCS	11	36.6
Induction of labor	18	60

LSCS, the most common indication of LSCS was fetal distress.

**Table 8: Indication for LSCS.**

Indication for LSCS	N	Percentage (%)
Primi breech	2	18.1
Previous 2 CS	2	18.1
Transverse lie	1	9.00
Severe preeclampsia	2	18.1
Fetal distress	3	27.7
Induction failure	1	9.00

## DISCUSSION

By analyzing sociodemographic characteristics, all the females were of lower economic status. According to research by Dapkekar et al, Ashwani et al, Sinha and Kurude, Singh and Ambujam and Radhakrishnan et al higher prevalence of IUGR has been associated with low socioeconomic status.<sup>7-11</sup> It was observed that maximum of the study population, 60% belonged to the age group of 20-30 years. In a study by Dapkekar et al the majority of IUGR cases were found in women belonging to the younger age group (21 to 25 years).<sup>7</sup> Hence, young maternal age was identified as an independent risk factor for FGR. Cases of IUGR were commonly seen in multigravidae patients (60%). A study by Ashwani et al has shown multiparity as a significant factor in developing IUGR.<sup>8</sup> The majority of patients, 76.66% presented at gestational age of  $\geq 37$  weeks. In this study 37% of cases underwent LSCS and most common indication was fetal distress 28%, similarly in a study by Sinha and Kurude, 59% of the cases underwent LSCS.<sup>9</sup> Most babies (73%), with IUGR had a birth weight between 2 to 2.5 kg similar results were seen in study by Sinha and Kurude.<sup>9</sup> NICU admissions were 20% with the perinatal mortality rate at 10%. The major risk factors identified were anemia, preeclampsia and oligohydramnios. Similar risk factors were noted in study by Dapkekar et al.<sup>7</sup>

The limitations of the study mainly involved a small sample size and a limited duration of the study which can be considered for the future scope of the present study.

## CONCLUSION

The study concluded that IUGR continues to be one of the major etiological factors for fetal morbidity and mortality and increase in rates of LSCS contributing maternal

morbidity. IUGR was commonly observed in multigravida patients, lacking antenatal care. The study also concludes that anemia and hypertensive disorders of pregnancy as well as oligohydramnios are the potential risk factors for IUGR due nutritional deficiency and inadequate growth environment. Lack of antenatal care leads to undiagnosed major risk factors leading to IUGR like anemia, preeclampsia, oligohydramnios etc. Provision of quality antenatal health care services, increasing patient awareness about nutrition, anemia, investigations, routine growth scans, adequate birth spacing, contraceptives advice, etc. have the potential to improve maternal and perinatal outcomes.

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