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A CLINICAL STUDY OF INTRAUTERINE GROWTH RESTRICTION (IUGR) PREGNANCIES

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ABSTRACT

Introduction: Intrauterine growth restriction (IUGR) is a condition in which the fetus fails to achieve its inherent growth potential. It is the second most common cause of perinatal morbidity and mortality following prematurity

Aims & Objectives: To study the clinical profile of IUGR pregnancies

Material & Methods: The present study was conducted in the Department of Obstetrics and Gynaecology/Department of Radiology, Government Medical College and Rajindra Hospital Patiala from 2010-2012. The cases were divided into two groups.

Group I - 100 cases of IUGR

Group II - 50 cases of normal pregnancy taken as controls.

A detailed history including age, parity, gestation age, antenatal checkups during pregnancy was taken followed by relevant investigations. Mode of delivery and fetal outcome were seen in all study subjects. The data collected was compiled, analyzed and compared in two groups to draw statistically significant conclusions.

Observations: The average age of study subjects was 25.74 years. In the present study 77% of subjects in Group I belonged to rural background and 50% of them were unbooked. Hypertensive disorders of pregnancy were associated with IUGR in 47% cases. In 21% of study subjects, AFI was <5. Preterm delivery occurred in 39% of cases in study group with caesarean section rate of 37%. In Group I, all babies were born with body weight < 2500 gms. Still birth rate in study group was 5%. In study group 71% of babies needed nursery admission with average stay of 14.2 days

Conclusion: Improvement in antenatal care will go a long way to decrease the morbidity and mortality in these intrauterine growth restricted pregnancies.

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INTRODUCTION

Intrauterine growth restriction (IUGR) is a condition in which the foetus fails to achieve its inherent growth potential. It is the second most common cause of perinatal morbidity and mortality following prematurity.^{1,2} The current WHO criteria for low birth weight is a weight less than 2500 gms or weight below the 10th percentile for the gestational age.³

Approximately, 70% of fetuses with birth weight below 10th percentile for gestational age are constitutionally small and in the remaining 30%, IUGR is pathological.⁴ In early onset or symmetrical IUGR growth of foetus is affected before 16 weeks of pregnancy & is due to chromosomal or structural abnormalities, aneuploidy maternal disease, malnutrition, intrauterine infection or severe problems with placenta. Late onset or asymmetrical growth restriction occurs generally in the third trimester with brain sparing effect and is due to placental insufficiency due to maternal disease as hypertension, anemia, heart disease and antepartum hemorrhage.⁵ Clinically, diagnosis of IUGR can be made from maternal weight gain, uterine fundal height, symphysiofundal

height and abdominal girth.^{6,7,8} Ultrasonography is the most useful tool for diagnosis of IUGR and differentiating symmetrical and asymmetrical IUGR by crown rump length, biparietal diameter, head circumference, abdominal circumference etc.^{9,10,11}

Aims & Objectives

The study was conducted with following objectives:

- To study the behavior of IUGR pregnancies
- To study mode of delivery in cases of IUGR
- To see fetal outcome in cases of IUGR pregnancies

MATERIAL AND METHODS

The present study was conducted on 150 cases (100 cases of IUGR and 50 cases of controls) in the Department of Obstetrics and Gynaecology/Department of Radiology, Government Medical College and Rajindra Hospital Patiala from 2010-2012. The cases were divided into two groups.

Group I - 100 cases of IUGR

Group II - 50 cases of normal pregnancy taken as controls.

Inclusion Criteria

1. Singleton pregnancy
2. Definitely known LMP with regular cycles.
3. Minimum 4 antenatal check ups.

Exclusion Criteria

1. Multiple gestation
2. Polyhydramnios

A detailed history including age, parity, gestation age, antenatal check ups during pregnancy was taken. Associated causes for IUGR for example hypertension, preeclampsia, underlying heart disease, renal disease, smoking, drug intake or any disorder was recorded on predesigned proforma. Relevant biochemical investigations were done. By USG, growth parameters (BPD, femur length, head circumference, abdominal, circumference), estimated fetal weight (EFW), Biophysical profile, amniotic fluid index (AFI) were assessed. Mode of delivery and fetal outcome were seen in all study subjects. The data collected was compiled, analyzed and compared in two groups to draw statistically significant conclusions.

Observations

In our study, majority of patients in study group (49%) as well as control group (72%) were in the age group of 19-25 years. (Table No 1)

In the present study 77% of subjects in Group I belonged to rural background and 23% to urban areas. 50% of subjects in study group were booked and 50% unbooked. 96% of study group subjects were from low socioeconomic status.

Table No 1 Distribution according to age of patients

Age (years)	Group I (Study group)		Group II (Control group)	
	No	%age	No	%age
19-25	49	49.00	36	72.00
26-30	38	38.00	9	18.00
31-35	10	10.00	5	10.00
36-40	3	3.00	0	0.00
Mean	25.74 years		24.68 years	
S.D.	3.98		3.91	
p value	0.10668			

Table No 2 Distribution according to identifiable causes (Group I)

S No.	Identifiable cause	No.
1.	Hypertensive disorder	47
2.	Anemia	27
3.	Oligo hydramnios	18
4.	Idiopathic including constitutional	12
5.	Urinary tract infection (UTI)	7
6.	Rheumatic heart disease	3
7.	Chronic Asthma	1
8.	Hypothyroidism	1

(Note: In some more than 2 factors were responsible)

As depicted in Table No 2, in majority (47%) of subjects, hypertensive disorders of pregnancy were associated with IUGR followed by anemia (27%), oligohydramnios (18%), idiopathic including constitutional (12%), UTI (7%), and Rheumatic heart disease (3%).

An important observation was that 30% of subjects in Group I (Study group) had a history of IUGR in previous pregnancy

Table No 3 Distribution of patients according to disparity of uterine fundal height in Group I

Uterine fundal height (disparity in weeks)	No of subjects	%age
4	58	58.00
6	35	35.00
> 6	7	7.00
Mean	4.8 weeks	

On examination, disparity between fundal height and period of gestation was seen in 58% of study subjects up to 4 weeks, in 35% up to 6 weeks and in 7% the disparity was found to be more than 6 weeks. (Table No 3)

Table No 4 Distribution of patients according to AFI

Amniotic fluid index (AFI)	Group I (Study group)		Group II (Control group)	
	No.	%age	No	%age
Normal (5-25)	79	79.00	50.00	100
Abnormal <5	21	21.00	0	00
p value	0.00569			

In study group (Group I), 79% patients had AFI within normal limits while 21% had AFI <5 as compared to controls (Group II) in which no patients had abnormal AFI. p value was highly significant, showing that oligohydramnios is more commonly associated with IUGR. (Table No 4)

We observed that in study group (Group I), 61% delivered at term where as 39% had preterm delivery. In the control group (Group II), 92% had term delivery and only 4% delivered before term.

Table No 5 Distribution of cases according to mode of delivery

Mode of delivery	Group I (Study group)		Group II (Control group)		p-value
Vaginal delivery	63	63.00	42	84.00	0.00975
LSCS	37	37.00	8	16.00	0.00975

In Group I (Study group), 63% had vaginal delivery compared to 84% in Control group which was highly significant.

The caesarean section rate was more in Group I was 37% and the most common indication for LSCS was fetal distress (59.45%). The p value was highly significant. (Table No 5) There were 5% still births in study group and none in control group. Thus perinatal mortality is more in IUGR pregnancies.

Table No 6 Distribution according to birth weight

Birth weight (gms)	Group I (Study group)		Group II (Control group)	
	No	%age	No	%age
< 1500	10	10.00	0	0.00
1500 to < 2000	39	39.00	0	0.00
2000 to < 2500	51	51.00	9	18.00
> 2500	0	0.00	41	82.00
Mean	1917.95		2879.00	
SD	335.09		365.49	
P value	0.0031			

In Group I (Study group), all babies were born with body weight > 2500 gms where as in Control group, majority (82%) of babies had birth weight > 2500 gms which was found to be highly significant. We concluded IUGR babies are more commonly associated with low birth weight. (Table No 6)

The mean APGAR scores in the new born babies of study group (Group I) were 7.45, 8.42 and 8.89 at 1, 5 and 10

minutes respectively. In control group (Group II) the mean APGAR score at 1, 5 and 10 minutes were 8.78, 9.00 and 9.00 respectively. p value came out to be significant depicting IUGR babies had low APGAR scores compared to normal babies.

Most common complications seen in study group were birth asphyxia (22%), followed by meconium aspiration (10%), septicemia (6%), hypoglycemia (3%) and respiratory distress syndrome and congenital anomalies in (2% each). In comparison, in control group there was one case (2%) of birth asphyxia (due to prolonged second stage of labor), one case (2%) had meconium aspiration and 2 cases (4%) developed hyperbilirubinemia.

Table No 7 Nursery stay of babies in both groups

Nursery Stay (days)	Group I (Study group)		Group II (Control group)	
	No	% age	No	%age
1-5	21	21.00	3	6.00
6-10	18	18.00	3	6.00
11-15	16	16.00	0	0.00
16-20	6	6.00	0	0.00
> 20	10	10.00	0	0.00
Nil	29	29.00	44	88.00
Average stay	14.2 days		5.5 days	
SD	8.42		5.5	
p value	0.00134			

There were 71 (71%) neonates suffering from IUGR who required nursery stay as compared to 6 (12%) neonates in control group.

Average stay of IUGR babies in nursery was 14.2 days as compared to control group where the stay was 5.5 days. p value was highly significant showing IUGR babies are more likely to need nursery admission.

The mean placental weight in study group was 351.40 ± 49.88 gms and in control group 491.10 ± 31.48 gms. The difference was statistically significant.

In our study in Group I, 47% subjects had abnormal Doppler findings in the form of raised S/D ratio, raised PI of umbilical artery and absent or reversed end diastolic flow in umbilical artery whereas all subjects in control group had normal color flow Doppler.

DISCUSSION

The mean age of patients in our study group was 25.74 years which is similar to the study done by Doctor BA *et al* (2001)¹² and Aucott SW (2004)¹³. In the present study the mean disparity in uterofundal height was 4.8 weeks in study group which is comparable to that of Haram K (2006).¹⁴ Hypertensive disorders were identifiable in 47 (47%) of cases of IUGR in our study which is in concordance with the study done by Sibai BM (2002)¹⁵ and Aucott SW (2004).¹³ Anemia was associated with IUGR in 27% of cases in present study which is similar to study done by Lone FW (2004).¹⁶ Oligohydramnios was identified in 18% cases of IUGR which is similar to the study done by Chauhan SP (2007).¹⁷ However Corosu R (1999)¹⁸ observed the higher incidence of (39.56%) oligohydramnios associated with IUGR. Idiopathic IUGR constituted 12 (12%) cases in our work but Narang A (1997)¹⁹ studied this entity in 58.3% of cases.

AFI was less than < 5 in 21 (21%) cases with IUGR in present study. 37 (37%) had LSCS in Group I in present study and

same incidence was observed by Cruz-Martinez R (2011).²⁰ Lakhkar BN (2006)²¹ observed an incidence of 62% due to enrolment of only IUGR and preeclampsia cases in their study. Mean birth weight of babies in our study was 1917.95 gms which is similar to study done by Fong KW *et al* (1999)²²

71% of IUGR babies were admitted to nursery with a mean nursery stay of 14.2 days as compared to 5.5 days in case of AGA babies. Aucott SW (2004)¹³ observed maximum number of nursery admissions with mean stay of 84 days because his study comprised of all preterm new borns.

Doctor BA *et al* (2001)¹² also observed 88% nursery admission but average stay was 3.54 days in their study because birth weight of babies in his study was 2609.0 gms which was higher than mean birth weight observed in studies of other authors. We found a still birth rate of 5% in our study in Group I which is comparable to study of Fong KW *et al* (1999)²², i.e. 4%. In the present study neonatal mortality was 12% in IUGR babies. Similar results were observed by Lakhkar BN (2006)²¹ *et al* who observed neonatal mortality 12.06%.

CONCLUSION

We concluded IUGR is more common in patients of low socioeconomic status and with poor antenatal care. Hypertensive disorders of pregnancy and anemia were found to be the most common etiological factors. Mothers with IUGR fetuses have more incidence of delivery by LSCS due to fetal distress. IUGR babies have low birth weight and require frequent nursery admissions and prolonged NICU stay as compared to normal birth weight babies. Improvement in antenatal care will go a long way to decrease the morbidity and mortality in these pregnancies.

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