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# A Case Control Study of Intrauterine Growth Restriction

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## Abstract

**Background:** Approximately 3% to 8% of all infants born in developed countries have been identified as growth restricted. IUGR is a prenatal condition and is associated with a higher risk for perinatal morbidity and mortality, with risk increasing with severity of the restriction.

**Methods:** This study was conducted at the Department of Obstetrics and Gynecology, SMS Medical College and Hospital, Jaipur, Rajasthan from the period of July 2018 to October 2019.

**Results:** In cases 3 babies had 5 apgar score (10%), 3 babies had 6 apgar score (10.00%), 8 babies had 7 apgar score (26.67%), 10 babies had 8 apgar score (33.33%), 6 babies had 9 apgar score (20.00%). In control 1 baby 5 apgar score (3.33%), 2 babies had 6 apgar score (6.67%), 7 babies had 7 apgar score (23.33%), 12 babies had 8 apgar score (26.67%), 8 babies had 9 apgar score (26.67%). P value is 0.510.

**Conclusion:** We concluded that no significant difference was seen in case and control group.

**Keywords:** APGAR, IUGR, Morbidity.

## Introduction

Intrauterine growth restriction (IUGR) can be described as the inability of a fetus to reach its designated growth potential at any gestational age; pregnancies with IUGR are affected by conditions that restrict the normal growth of the fetus. The term IUGR is often used synonymously with small for gestational age (SGA), defined as a birthweight (BW) or estimated fetal weight (EFW) < 10th percentile for gestational age and sex. Fetuses identified as growth restricted, however, comprise a heterogeneous group regarding causal factors, management, and prognosis. Many fetuses or infants with an EFW/BW < 10th percentile are perfectly normal and simply "constitutionally" small. The American College of Obstetricians and Gynecologists Committee highlights that the distinction between normal and pathological growth in clinical practice is challenging. [1-2]

Approximately 3% to 8% of all infants born in developed countries have been identified as growth restricted. IUGR is a prenatal condition and is associated with a higher risk for perinatal morbidity and mortality, with risk increasing with severity of the

restriction. A recent population-based study confirmed that IUGR is the single largest risk factor for stillbirth, increasing the stillbirth rate fourfold compared to pregnancies with normally grown fetuses; antenatal nondetection further increases the rate by a factor of two. An early antenatal detection, choosing the optimal time and method of delivery, and treatment where appropriate could minimize the risks significantly. Umbilical artery Doppler examination is the most valuable tool regarding the prediction of perinatal outcome in growth-restricted fetuses and is accepted as the primary assessment tool regarding diagnosis of IUGR. However, low antenatal detection rates of suboptimal fetal growth through routine fetal ultrasonography have been reported. In fact IUGR has been reported to be antenatally detected only in one-third (25% to 32%) of pregnancies with suboptimal fetal growth [3-4]

**Materials and Methods**

This study was conducted at the Department of Obstetrics and Gynecology, SMS Medical College and Hospital, Jaipur, Rajasthan from the period of July 2018 to October 2019. The protocol of the study was submitted to the institutional research board of our college. The research board concluded that the present study was exempt.

Patients in active labor irrespective of their parities, who had singleton pregnancies with live babies who were either delivered by vaginal or LSCS included in study and observed in second and third stage of labour.

**Inclusion Criteria**

1. Women in active labour admitted to LR
2. Pregnant mothers of any age and parity
3. Gestational age more than 28 weeks
4. Singleton live fetus

**Exclusion Criteria**

1. Anomalous foetus
2. foetus with single umbilical artery
3. mothers with drug abuse and smoking
4. multifetal gestation

Written and informed consent taken from all the subjects. A form was completed for each subject detailing her demographic, obstetric and medical history. Proper history was taken , general physical examination of the subjects were done. Then obstetrical examination was done. Subjects divided in two groupscontrols and cases.

- Group A (study group) : women with IUGR
- Group B (control group) : women without IUGR

IUGR defined as fetuses with a birth weight less than the 10$^{th}$ percentile of those born at the same gestational age or two standard deviation below the population mean.

Close intrapartum monitoring of the subjects were done for uterine contractions, dilation of the cervix, descent of the head and fetal heart sound. Duration of labour and mode of delivery was noted.

After delivery the umbilical cord was clamped, cut and the baby was handed over to the Pediatrician. The cord was tied and cut as close to baby as possible. The umbilical cord was measured in its entirety, including the length of placental end of the cord and the umbilical stump on the baby. The following parameters were noted-

1. Gestational age at delivery
2. Live or still born
3. Apgar score
4. Sex of the baby
5. Meconeum staining of the liquor
6. Any congenital malformations
7. Birth weight of the baby

8. Evidence of intrauterine growth retardation

All the data thus obtained were charted, tabulated and statistical analysis was done using chi-square test, Fisher's exact test wherever applicable, statistical significance was defined as P value less than 0.05 for all analyses.

**Observations and Results**

Table 1: Age Distribution of subjects in case and control

| | Case | Control |
|---|---|---|
| Mean ± SD | 25.03±3.09 | 25.63±3.76 |
| P value | 0.422 | |

In our study there were 30 cases and 30 controls out of which in cases 21 were between 20-25 years age group and 9 were between 26-32 years of age group. In control 17 were between 20-25 years of age group and 13 were 26-32 years of age group. P-value was 0.422 there were no significant difference found between two groups.

Table 2: Mode of Delivery in case and control groups

| | Case | | Control | |
|---|---|---|---|---|
| | No. | % | No. | % |
| ND | 20 | 66.67 | 23 | 76.67 |
| LSCS | 10 | 33.33 | 7 | 23.33 |
| Total | 30 | 100.00 | 30 | 100.00 |
| P value | 0.567 | | | |

In our study there were 20 Normal vaginal delivery (66.67%) in cases and 10 were LSCS (33.33%). In controls there were 23 normal vaginal delivery (76.67%) and 7 were LSCS (23.33%).P value is 0.567. There is no significant difference found between case and control group.

Table 3: Baby Weight of subjects in case and control groups

| | Case | | Control | |
|---|---|---|---|---|
| | No. | % | No. | % |
| <2 | 13 | 43.33 | 0 | 0 |
| >2 | 17 | 56.67 | 30 | 100.00 |
| Total | 30 | 100.00 | 30 | 100.00 |
| Mean±SD | 2.04±0.26 | | 2.91±0.23 | |
| P value | P<0.001 | | | |

In our study there we observed that 13 cases had birth weight of < 2 standard deviation (43. 33%) and 17 cases had >2 standard deviation of baby weight (56.67%) and in controls 30 subjects had birth weight of >2 standard deviation. This difference in both the group is statistically highly significant as P value is < 0.001

Table 4: Meconium staining of liquor found in case and control groups

| | Case | | Control | |
|---|---|---|---|---|
| | No. | % | No. | % |
| Present | 6 | 20.00 | 7 | 23.33 |
| Absent | 24 | 80.00 | 23 | 76.67 |
| Total | 30 | 100.00 | 30 | 100.00 |
| P value | 0.148 | | | |

In our study in 6 cases meconium staining of liquor were present (23.33%) and in 24 cases meconium staining of liquor were absent (76.67 %). In controls in 7 subjects meconium staining of liquor were present (6.67%) and In 23 subjects meconium staining of liquor were absent (93.33%). P value is 0.148. There is no significant difference found between case and control groups.

Table 5: NICU admission of babies in case and control groups

| | Case | | Control | |
|---|---|---|---|---|
| | No. | % | No. | % |
| Yes | 9 | 30.00 | 5 | 16.67 |
| No | 21 | 70.00 | 25 | 83.33 |
| Total | 30 | 100.00 | 30 | 100.00 |
| P value | 0.360 | | | |

This table show in cases 9 babies were shifted to NICU (30%) and in controls 5 babies were shifted to NICU (16.67%). P value is 0.360 there is no significant difference found between two groups.

Table 6: Apgar Score of babies in case and control group

| | Case | | Control | |
|---|---|---|---|---|
| | No. | % | No. | % |
| 5 | 3 | 10.00 | 1 | 3.33 |
| 6 | 3 | 10.00 | 2 | 6.67 |
| 7 | 8 | 26.67 | 7 | 23.33 |
| 8 | 10 | 33.33 | 12 | 40.00 |
| 9 | 6 | 20.00 | 8 | 26.67 |
| Total | 30 | 100.00 | 30 | 100.00 |
| P value | 0.510 | | | |

This table shows in cases 3 babies had 5 apgar score (10%), 3 babies had 6 apgar score (10.00%), 8 babies had 7 apgar score (26.67%), 10 babies had 8 apgar score (33.33%), 6 babies had 9 apgar score (20.00%). In control 1 baby 5 apgar score (3.33%), 2 babies had 6 apgar score (6.67%), 7 babies had 7 apgar score (23.33%), 12 babies had 8 apgar score (26.67%), 8 babies had 9 apgar score (26.67%). P value is 0.510. There is no difference found between two groups.

**Discussion**

The umbilical cord is one of the most vital organ in a fetus. It is required for the development, well being and survival of a fetus. The vessels in umbilical cord is vulnerable to torsion, compression and is thus protected by Wharton jelly, the amniotic fluid, the helical pattern or the coiling of the umbilical cord.

Several studies have addressed the correlation between abnormal cord coiling and adverse pregnancy outcomes and most of them show an increase in adverse pregnancy outcome when there is an abnormal cord coiling.

In our study we included 60 subjects in which 30 were cases and 30 were controls. The cases include women with IUGR and controls include women without IUGR.

The mean number of coils in our study was 17.84 ± 0.05 which was similar to the study of Patil NS et al 16. 64 ± 0.09 and Mittal et al 19.59 ± 0.05

In our study there were 30 cases out of which 21 were between 20-25 years age group and 9 were between 26-32 years of age group with mean age of 25.03±0.09. In control 17 were between 20-25 years of age group and 13 were 26-32 years of age group with mean age of 25.63±0.07 which were similar to Kashanian M et al with mean age of 24.03±0.03 and Gupta S et el with mean age of 25.05±0.07. There were no significant difference found between two groups.

In our study there were 20 Normal vaginal delivery (66.67%) in cases and 10 were LSCS (33.33%). In controls there were 23 normal vaginal delivery (76.67%) and 7 were LSCS (23.33%). P value is 0.567 so there is no significant difference found between case and control group.

In our study we observed that 13 cases had birth weight of < 2 standard deviation (43. 33%) and 17 cases had >2 standard deviation of baby weight (56.67%) and in controls 30 subjects had birth weight of >2 standard deviation. The mean±SD in case group was 2.04±0.26 and in control group was 2.91±0.23 which was similar

to Monique de laat MW 2.54±0.45 and Rabiee M et al 2.34±0.25.P value is < 0.001. The difference between case and control group is statistically significant as IUGR subjects were included in study group (case).

In our study in 6 cases meconium staining of liquor were present (23.33%) and in 24 cases meconium staining of liquor were absent (76.67 %). In controls in 7 subjects meconium staining of liquor were present (6.67%) and In 23 subjects meconium staining of liquor were absent (93.33%). P value is 0.148 so there is no significant difference found between case and control groups.

In our study we found that in cases 3 babies had 5 apgar score (10%), 3 babies had 6 apgar score (10.00%), 8 babies had 7 apgar score (26.67%), 10 babies had 8 apgar score (33.33%), 6 babies had 9 apgar score (20.00%). In control 1 baby 5 apgar score (3.33%), 2 babies had 6 apgar score (6.67%), 7 babies had 7 apgar score (23.33%), 12 babies had 8 apgar score (26.67%), 8 babies had 9 apgar score (26.67%). P value is 0.510 so there is no significant difference found between two groups.

**Conclusion**

We concluded that no significant difference was seen in case and control group.

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