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Study on pregnancy outcome in normal and intrauterine growth restriction

Sudhakara Babu Chelli

PhD Scholar, Bharath Institute of Higher Education and Research, Chennai, Tamil Nadu

Nagaraj S.

Associate Professor, Department of Anatomy, SVS medical college, Mahabubnagar, Telangana

Shwetha Nama

Assistant Professor, Department of Anatomy, MRIMS, Hyderabad, Telangana

Surekha S. M.

Associate Professor, Department of Obstetrics & Gynaecology, KIMS, Koppal, Karnataka

Govindarajan Sumathy

Govindarajan Sumathy, Professor. & HOD, Department of Anatomy, Sree Balaji dental college & hospital, BIHER, Chennai, Tamil Nadu

*Corresponding author email: sumathyravi93@gmail.com

Abstract--Background: Failure in achievement of predetermined growth genetically due to placental, fetal, maternal and several external variables is known as intrauterine growth restriction (IUGR). It accounts more in developing countries. Materials and methods: All the data of the patients were noted in a pre-structured case proforma after taking informed consent. Study population was divided into 50 cases and 50 controls. Results: In IUGR lower segment caesarean section (LSCS) was observed in 64 % and normal vaginal delivery was 36 %. In IUGR neonate's distribution was 42% males and 58% females. In IUGR, NICU admissions were 40%, 10% stillbirth and 50% were normal without any morbidities. Conclusion: The observation in our study reveals that in female neonates the incidence is more than males. The outcome of IUGR is adverse with a greater number of NICU admissions and stillbirth.

Keywords--predetermined growth, IUGR, lower segment caesarean section, NICU, stillbirth.

Introduction

Intrauterine growth restriction (IUGR) refers to birth weight less than 10th percentile for gestational age (GA). It is synonymously known as fetal growth restriction (FGR). Failure in achievement of predetermined growth genetically due to placental, fetal, maternal and several external variables. Additionally, long term and short-term dangers are encountered along with accelerated chance in perinatal morbidity and mortality ¹. Infants affected by IUGR are nearly 30 million per year and observed in 24 % neonates ². In fetuses with IUGR cardiac output is altered with advance and extra suggested right than that of left and diastolic than that of systolic fetal cardiac work retrogression ³. It is a principal vascular disorder with impeded fetal development and multivessel cardio vascular indications in fetus ⁴. It is related to increased morbidity in premature infants that include low APGAR score, necrotizing enterocolitis hypoxic brain injury with long term outcome ⁵.

Aim of the study

To find out the pregnancy outcome in normal and intrauterine growth restriction.

Materials and Methods

Study type: Prospective case control study.

Study setting: Government district hospital, KIMS, Koppal.

Sample size: n = 100.

This study was carried out after taking institutional ethical committee clearance and informed consent from the patients was taken before collecting data. The samples were divided into 50 controls and 50 cases after applying inclusion and exclusion criteria. Singleton pregnancies with maternal age:18- 35 years, GA: 34-41weeks, hypertensive disorders of pregnancy, oligohydramnios, anemia were included in study. Preterm deliveries, diabetes, unknown gestational age, HIV, any other congenital anomalies were excluded. All the data was collected in a case proforma. Statistical analysis was done using SSPS 25.

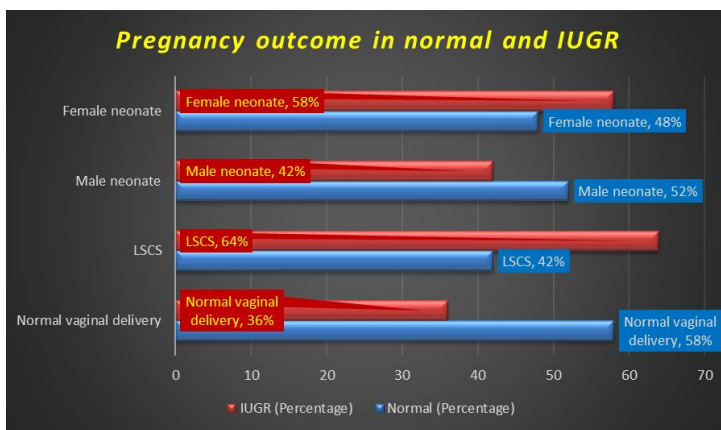
Results

The summary of pregnancy outcome in this study is given in table -1and graph-1. In IUGR lower segment caesarean section (LSCS) was observed in 64 % and normal vaginal delivery was 36 %. In normal group, 58 % normal vaginal delivery and 42% LSCS was observed. Neonates were 52% males and 48% females in normal group while 42% males and 58% females in IUGR.

Table 1
Pregnancy outcome in normal and IUGR

Pregnancy outcome	Normal (Percentage)	IUGR (Percentage)
<i>Delivery type</i>		
Normal vaginal delivery	29 (58%)	18 (36%)
LSCS	21 (42%)	32 (64%)

Gender of neonate		
Male	26 (52%)	21 (42%)
Female	24 (48%)	29 (58%)

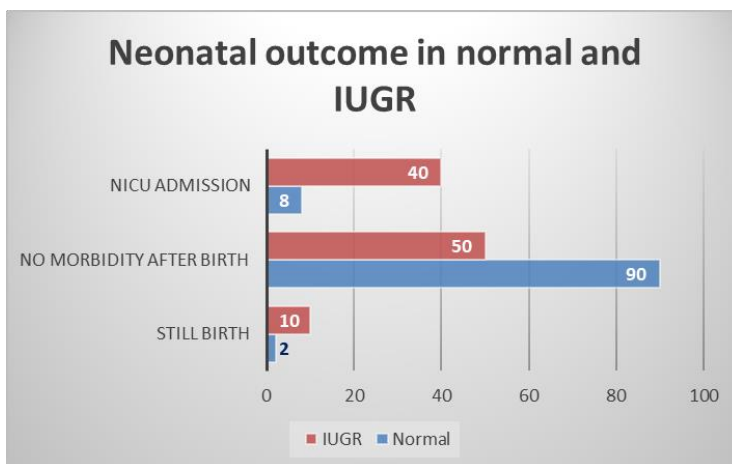


Graph 1. Pregnancy outcome in normal and IUGR

In normal group, admission to NICU was observed in 8%, 2% stillbirth and 90% were normal without having any other morbidities. In IUGR, NICU admissions were 40%, 10% stillbirth and 50% were normal without any morbidities. Summary of this observations are given in table-2 and graph-2.

Table 2
Neonatal outcome in normal and IUGR

Neonatal outcome	Normal	IUGR
Still birth	1 (2%)	5 (10%)
No morbidity after birth	45 (90%)	25 (50%)
NICU admission	4 (8%)	20 (40%)



Graph 2. Neonatal outcome in normal and IUGR

Discussion

Associated with several multifactorial aspects, FGR is global phenomenon that is challenging in developing countries. Bilardo CM et al observed 26 % infants with adverse perinatal outcome in early and severe IUGR which were due to changes in pathology of DV (ductus venosus), UA (umbilical artery) and STV (short term variations) in fetal heart ⁶. Women with systemic lupus erythematosus exacerbations in pregnancy had a higher risk of fetal loss, IUGR and preterm deliveries than those without as stated by Al Arfaj AS and Khalil N in their study. They also stated Raynaud's positive and hypertensive pregnancies had IUGR neonates common in both ⁷. Prematurity was linked to an increase in IUGR. Growth restriction had no effect on prematurity that is linked to poor newborn outcomes until 3rd trimester. Increased adverse outcomes were observed after 3rd trimester than in premature infants who had grown normally as per Gilbert WM and Danielsen in their study ⁸.

Foetal loss after 20 weeks of pregnancy, severe PE (preeclampsia) beyond 36 weeks, and severe IUGR are adverse pregnancy outcomes as stated by Hossain N and Paidas MJ ⁹. Dhobale M summarized the importance of changes in brain derived neurotrophin and nerve growth factor expression that cause aberrant foetal growth and brain development, raising the risk of metabolic syndrome, cardiovascular disease and neurodevelopmental abnormalities in preterm babies ¹⁰. Odibo AO et al identified that increased maternal age was linked to an increased incidence of IUGR in a dose-response relationship ¹¹. Haddad B et al in their study found that women with severe PE at 24-33 weeks of gestation, showed severe fetal growth restriction was related to an increased risk of fetal death but has no effect on complications in mother ¹².

Developmental delays previously not recognized by conventional standards, such as average height but relatively small children of mothers with a high body mass index, identified by IUGR as a cause of increased risk perinatal mortality in obese pregnant women ¹³. Pregnancy outcome in a study conducted in IUGR group by Kotrannavar SS et al showed 15 %, 4 % NICU admission and stillbirth respectively. 49% normal, 4 % instrumental vaginal and 47 % caesarean was mode of delivery ¹⁴. Our study is far with the findings of the above author where we observed 40% NICU admission, and 10% stillbirths. Distribution of gender in our study is near to the findings of above authors while delivery mode is contrast to their findings.

IUGR is a pregnancy complication with unwanted outcome for the health of fetus. Clinical and sociological risk factors can assist in identifying pregnant woman with IUGR¹⁵. Muniyar N et al studied maternal and fetal outcome in IUGR with 20% vaginal and 80% lower segment caesarean section. In their study they observed 16.66 % normal fetus, 60% NICU admissions and ventilator assistance required was for 22.22 %, neonatal mortality and intrauterine fetal death was 5 % each ¹⁶. We observed a greater number of LSCS (64%) in our study than normal (36%) which is similar to the findings of the above authors where LSCS were more in their study.

Maternal periodontitis is associated with an increased risk of low birth weight, preterm birth, fetal growth restriction¹⁷. Growth aberrations, due to intrinsic fetal elements along with aneuploidy and multifactorial anomalies and fetal infections have a defensive prognosis¹⁸. Declining intrauterine growth can eventually have a negative impact on brain development and intellectual development¹⁹. Neurodevelopment is also associated with growth restriction and preterm birth²⁰. Children with a history of FGR were initially found to have impaired attention and performance²¹. In FGR, females are the fetal gender who are prone to develop FGR as per as stated by Radulescu L²². Low socioeconomic status shows a positive correlation significantly with FGR. Key role in reducing FGR is by improving nutritional and socioeconomic status¹. Multiparity and young maternal age has been found to be an important demographic factor associated with FGR²³. Small for gestational age (SGA) /IUGR is a quit end result of numerous etiologies that consists of placental, maternal and fetal elements and currently brought genetic elements too additionally make contributions to IUGR²⁴. As oxidative stress is increased in FGR, providing antioxidants to high-risk patients may help to prevent or treat FGR as there is no definitive treatment outcome for this²⁵.

Conclusion

The observation in our study reveals that in female neonates the incidence is more than males. The outcome of IUGR is adverse with a greater number of NICU admissions and stillbirth. As the burden of IUGR is more in developing countries, regular follow up and diagnosis during antenatal period and proper management and timely delivery would avoid the adverse outcome.

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Conflict of interest: None

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