

STUDY OF CLINICAL PROFILE OF INTRAUTERINE GROWTH RESTRICTION BABIES ADMITTED IN NEONATAL INTENSIVE CARE UNIT AT A TERTIARY CARE HOSPITAL- A DESCRIPTIVE CROSS-SECTIONAL STUDY

Paediatrics

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ABSTRACT

Background: IUGR is the failure of the fetus to reach its growth potential. Fetal growth is regulated at multiple levels. Besides maternal disorder, fetal structural and chromosomal anomalies are the added factors. The morbidities associated with IUGR could have long term implications in adult life which predisposes in a development of a number of chronic diseases. **Material:** It is a cross-sectional study conducted at Neonatal Intensive Care Unit of a Tertiary Care Hospital. Database of all admissions in NICU during the above period were reviewed. Case records of all babies admitted were analyzed. Among all the (IUGR) babies admitted in NICU during the study period, Total 120 neonates, who satisfied the Inclusion criteria were selected by systematic random sampling. The risk factors, clinical status and immediate outcome were obtained from the case records. An informed consent was taken before analyzing the case records. **Results:** Among the total study population of 120 IUGR babies, 67 (55.83%) are males and 53 (44.17%) are females. Among the 120-study population 82 (68.3%) babies were classified as asymmetrical IUGR and 38 (31.7%) babies were classified as symmetrical IUGR as per Ponderal Index. Hypoglycemia 73(60.83%), Hypocalcaemia 36(30.00%), Birth Asphyxia 34 (28.33%), and Neonatal Sepsis 30(25.00) are the commonest complication. **Conclusion:** Hypoglycemia, hypocalcaemia and hypothermia are the common treatable complications in this study which can be easily identified and treated. So, in IUGR babies it is important to anticipate these conditions and treat appropriately to prevent further morbidity and mortality.

KEYWORDS

IUGR, SGA, Morbidity, Neonatal mortality, NICU.

INTRODUCTION

Intrauterine Growth restriction (IUGR) is a common complication of pregnancy that carries significant short and long-term sequelae that reaches out to adulthood.¹ Next to preterm birth, IUGR is the second leading cause of perinatal mortality. Intra-Uterine Growth Retardation (IUGR) is failure to attain optimal intrauterine growth which is defined as either birth weight less than the 10th percentile for gestational age or as birth weight less than 2 standard deviations below the mean value for gestational age.

The severe morbidity is represented by intraventricular hemorrhage, bronchopulmonary dysplasia, necrotizing enterocolitis, sepsis, pulmonary hemorrhage, hypothermia and hypoglycemia. Appropriate antenatal diagnosis, treatment and timely delivery could diminish these risks significantly.^{2,5}

Approximately 30 million infants suffer from IUGR every year. The burden is mainly concentrated in Asia which accounts for yearly 75% of all affected cases. In India prevalence of low birth weight has been reported as 26% while the proportion of IUGR has been found to be 54%.⁹

But ironically even though India has large number of IUGR cases along with high prevalence of mortality in these neonates, there is scarcity of Indian studies in this area. This background prompted us to take up this study in order to find the prognosis and clinical profile of these neonates admitted in NICU.

It is cross-sectional study. The study was conducted to study clinical profile of a neonate born and admitted in NICU during study period.

MATERIAL AND METHODS

It is a cross-sectional study conducted at Neonatal Intensive Care Unit of a Tertiary Care Hospital. Database of all admissions in NICU during the above period were reviewed. Case records of all babies admitted were analyzed. Among all the (IUGR) babies admitted in NICU during the study period, Total 120 neonates, who satisfied the Inclusion criteria were selected by systematic random sampling. The risk factors, clinical status and immediate outcome were obtained from the case records. An informed consent was taken before analyzing the case records.

Inclusion Criteria

- 1) All IUGR babies admitted in NICU
- 2) Both male and female neonates were included in this study.
- 3) Both types of IUGR (symmetrical and asymmetrical IUGR)
- 4) Parents willing to give consent for this study.

Exclusion Criteria

- 1) Newborns whose parents are not willing to give consent for the study.
- 2) Newborns with chromosomal abnormalities.
- 3) Newborns with congenital anomalies.

Detailed Procedure Of Study Conduct

Among all the (IUGR) babies admitted in NICU during the study period, Total 120 neonates, who satisfied the Inclusion criteria were selected by systematic random sampling. Informed consent of their parents was taken after explaining in detail about the method and procedures involved in the study in their vernacular language. The socio demographic profile and relevant information of individual babies and their respective mothers was collected by interviewing the mother using a structured proforma (Annexure: 1). Various factors such as clinical details, outcome of these neonates, indices like mortality and morbidity and pattern of growth were studied.

Laboratory Investigation

- 1) CBC – Hb, PCV, TC, DC, Platelet Count, ESR
- 2) Blood Sugar, Urea and Serum Creatinine
- 3) Serum calcium
- 4) Chest X Ray
- 5) Total and Direct Bilirubin (Only for Icteric babies)
- 6) Sepsis Screening (Only for the suspected sepsis babies) - Peripheral smear for band forms and Toxic granules, Blood culture and sensitivity, CSF Analysis with culture and sensitivity.

Outcome Measures

The following outcome measures were quantified in the study.

- 1) Incidence of IUGR
- 2) Immediate Complications.
- 3) Condition at discharge.
- 4) Mortality

Clinical Outcome

It was assessed in three aspects namely Dead, Abnormal neurological examination at discharge and good condition at discharge. Babies who had some morbidity but improved clinically over the duration of stay in the hospital and taking feeds properly during discharge were categorized as discharged with good condition. Babies having poor feeding & sent along with antiepileptic drugs and showing abnormal neurological examination was categorized as Abnormal neurological examination at discharge.

Abnormal Neurological Examination Includes

- asymmetries of posture or reflexes (marked or persistent)

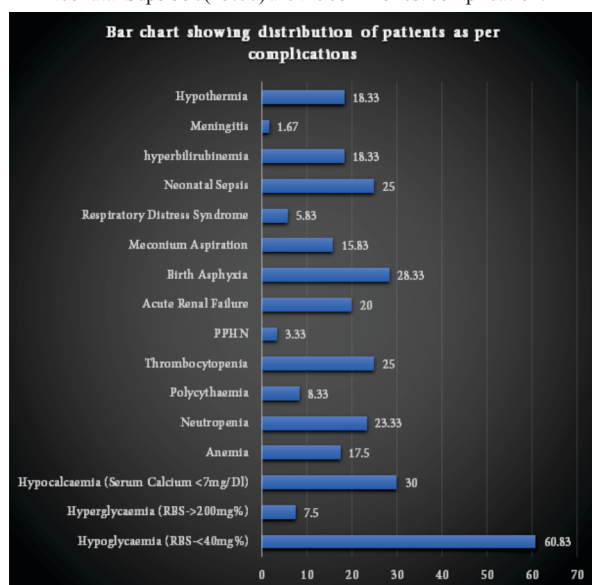
- decreased flexor or extremity tone or axial tone for post conceptional age
 - cranial nerve or oromotor dysfunction
 - abnormal sensory responses
 - abnormal behaviour (lethargy, irritability or jitteriness) and
 - extensor neck, trunk or extremity tone.
- (Amiel Tison angles –Annexure: 5)

Statistical Methods

Data were entered in Excel spreadsheet and analysed using SPSS version 13.0. The results were analysed using the statistical test like simple proportions, Risk ratio and Chi-square test. The p-value <0.05 was considered as statistically significant.

RESULTS

- Present study in conducted in department of paediatrics at tertiary care center. During study period around 1240 neonates were admitted in NICU. Among which 186 babies were diagnosed with IUGR. In Present study which we included total 120 babies as per inclusion and exclusion criteria.
- Among the total study population of 120 IUGR babies, 67 (55.83%) are males and 53 (44.17%) are females.
- Of the total 120 babies 29 (24.17%) are Preterm babies and 91(75.83%) are Term babies.
- The gestational age of the respective mothers of the study population. 82 (68.3%) mothers are primi and 26(21.67%) are 2nd gravida mothers. The 3rd gravida mothers are 8 (6.7%) and only 4(3.33%) are the 4th gravida mothers.
- Of the 120 babies 66 (55.0%) are in the birth weight category of 2.0 - 2.5 kg and 38 (31.67%) are in the birth weight category of 1.5 – 1.99 kg. 10 (8.33%) babies are in the category of 1.0 – 1.49 kg and 6 (5.0%) babies are in less than 1.0 kg category.
- Of the 120 babies, 72 (60.0%) have been delivered by normal vaginal delivery and 48(40%) have been delivered by Caesarian section.
- Among the 120 study population 82 (68.3%) babies were classified as asymmetrical IUGR and 38 (31.7%) babies were classified as symmetrical IUGR as per Ponderal Index.
- The below chart shows that hypoglycemia 73(60.83%), Hypocalcaemia 36(30.00%), Birth Asphyxia 34 (28.33%), and Neonatal Sepsis 30(25.00) are the commonest complication.



- Among the 120-study population majority of patients belong to stage-I 16(47.06%), Stage-II include 15(44.12%) and stage-III have only 3(8.82%) patients.
- Among the 120-study population, 47(39.17%) required oxygen support during treatment.
- Of the 120 babies 18 (15.00%) have died in the hospital. 12(10.00%) have been discharged with abnormal neurological examination and 90(66.3%) have been discharged with good condition at Discharge condition.

DISCUSSION

Present study in conducted in department of paediatrics at tertiary care

center. During study period around 1240 neonates were admitted in NICU. Among which 186 babies were diagnosed with IUGR. In Present study which we included total 120 babies as per inclusion and exclusion criteria. Incidence of IUGR neonates admitted in NICU at was during study period was 15%, Similar incidence was note by Fikree and Berendes.⁶⁴ In their study they found a total of 1000 pregnant women, an incidence of IUGR of 15.7% below 20 years as opposed to AGA of 10.5%. According to national perinatal database, the incidence of IUGR is said to be 9.65% among new born. According to Chandra and Mathews et al, incidence of IUGR was 14.1%. According to Shenoy et al, the incidence of IUGR in south Kerala is 10.35%.⁶⁵⁻⁶⁷

In present study, among the total study population of 120 IUGR babies, 67 (55.83%) are males and 53 (44.17%) are females. Similar results were observed in a study conducted by Shah GS et al.⁶² Anurekha V et al.,⁶⁹ and Khalid S et al.,⁷⁰

In present study, among total 120 babies 29 (24.17%) are Preterm babies and 91(75.83%) are Term babies. Similar results were observed in a study conducted by Manandhar T et al.,⁵⁸ Anurekha V et al.⁶⁹ and Rangarajan B et al.⁶⁰

In present study, among total 120 babies the gestational age of the respective mothers of the study population. 82 (68.3%) mothers are primi and 26(21.67%) are 2nd gravida mothers. The 3rd gravida mothers are 8 (6.7%) and only 4(3.33%) are the 4th gravida mothers. Similar results were observed in a study conducted by Manandhar T et al.⁵⁸ Zubair DS et al.⁶¹ and Ashwani N et al.⁶⁹

In present study, out of the 120 babies 66 (55.0%) are in the birth weight category of 2.0 - 2.5 kg and 38 (31.67%) are in the birth weight category of 1.5 – 1.99 kg. 10 (8.33%) babies are in the category of 1.0 – 1.49 kg and 6 (5.0%) babies are in less than 1.0 kg category. Similar results were observed in a study conducted by Rangarajan B et al.⁶⁰ and Surve R and Jain A.,⁷¹

Bernstein et al. examined the association between IUGR and adverse neonatal outcomes in a population of 19,759 singleton very-low-birth-weight neonates without major birth defects. IUGR within the range of 501 to 1500 g birth weight was associated with increased risks of neonatal death, necrotizing enterocolitis, and respiratory distress syndrome.⁷²

Most of the growth restricted fetuses with impaired placental function withstand poorly the stress of labor so the chances for operative delivery is much more frequent among IUGR fetuses.

In present study, out of the 120 babies, 72 (60.0%) have been delivered by normal vaginal delivery and 48(40%) have been delivered by Caesarian section. Similar results were observed in a study conducted by Manandhar T et al.⁵⁸ and Erika F et al.,⁷³

Among the 120-study population 82 (68.3%) babies were classified as asymmetrical IUGR and 38 (31.7%) babies were classified as symmetrical IUGR as per Ponderal Index. Similar results were observed in a study conducted by Manandhar T et al.,⁵⁸ Dashe et al.,⁷⁴ and Emilie M et al., found that 38.7% were symmetric and 61.3% were asymmetric.⁷⁵

In present study we found that hypoglycemia 73(60.83%), Hypocalcaemia 36(30.00%), Birth Asphyxia 34 (28.33%), and Neonatal Sepsis 30(25.00) are the commonest complication. Among the 120-study population majority of patients belong to stage-I 16(47.06%), Stage-II include 15(44.12%) and stage-III have only 3(8.82%) patients. Similar results were observed in a study conducted by Shah GS et al.,⁶² Manandhar T et al.,⁵⁸ and Rocha CO et al.⁷⁶

Of the 120 babies 18 (15.00%) have died in the hospital. 12(10.00%) have been discharged with abnormal neurological examination and 90(66.3%) have been discharged with good condition at Discharge condition. Similar results were observed in a study conducted by Dap M et al.,⁷⁷ Bassetty KC et al.⁶³ and Anurekha V et al.⁶⁹

CONCLUSION

Hypoglycemia, hypocalcaemia and hypothermia are the common treatable complications in this study which can be easily identified and treated. So, in IUGR babies it is important to anticipate these conditions and treat appropriately to prevent further morbidity and

mortality.

Perinatal asphyxia and Meconium Aspiration are associated with abnormal neurological examination at Discharge. Perinatal asphyxia, Pulmonary hemorrhage and Persistent pulmonary hypertension are associated with Death during the hospital stay.

Lower gestational age and Lower birth weight of the baby are the significant fetal risk factors associated with mortality.

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