

Original Article

The Prevalence of Intrauterine Growth Restriction and Related Postnatal Consequences in Newborns at Tishreen University Hospital in Lattakia

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Abstract - Background: Intrauterine growth restriction is a common health problem that has increased in incidence in recent years, with consequences ranging from simple to serious and from short to long-term. **Objective:** The purpose of this study is to determine the prevalence and postnatal consequences of IUGR in neonates born at Tishreen University Hospital. **Material and methods:** An observational descriptive cross-sectional study involved all children born at Tishreen University Hospital and admitted to the neonatal intensive care unit during the study period from July 2021 until February 2023. Infants with congenital malformation were not included in the study. Data was collected by filling out the questionnaire for the study by a doctor. **Results:** In the current study, the prevalence of IUGR was 7.1%. Thermoregulation disorder was the most common complication, with a percentage of 34%, followed by 28% blood sugar disorder and RDS at 24.4% of newborns. The other consequences were: thrombocytopenia 17,1%, neutropenia 14,6%, perinatal asphyxia 13,4%, hypocalcemia 9,7%, anemia 7,3%, seizures 6,1%, IVH 3,7%, PVL 2,4%. **Conclusion:** The study showed a high prevalence of IUGR in newborns at Tishreen University Hospital and multiple postnatal consequences in the same newborn.

Keywords - Intrauterine growth restriction, Prevalence, Postnatal consequences.

1. Introduction

Intrauterine growth restriction is an important health problem.

Its incidence has increased in recent years despite the development of healthcare methods.

Its consequences vary in severity and time of onset.

Where it ranges between short and long-term and simple and serious

Which may lead to the death.

The approximate incidence of IUGR ranges from (3-10)% to 15%. Of the live newborns and constitutes 20% of the births Stillbirth.

This percentage varies between countries and according to population density and ethnicity.

It is six times higher in developing countries than in developed countries.

Fetal, placental and maternal factors, in addition to Environmental factors, especially smoking, play a major role in the occurrence of IUGR in both symmetrical and

asymmetrical forms and subsequent complications. During the neonatal period (such as blood and metabolic disorders...), and long-term complications (such as an increased risk of type 2 diabetes, obesity....) during childhood and adulthood.

1- 2. Patients and Methods

2.1. Study Population

After approval by the local research ethics committee, an observational descriptive cross-sectional study was conducted on 82 neonates born at Tishreen University Hospital in Lattakia during the time period extending from 8 July 2021 for a period of twenty months. They had intrauterine growth restriction out of 1166 neonates born in that period who met the criteria for inclusion in the research.

Inclusion Criteria were as follows:

All newborns in Tishreen University Hospital during the study period (starting from 8 July 2021, for a period of twenty months).

Complications were studied among those admitted to the neonatal intensive care unit.

2.1.1. Non-Inclusion Criteria

Newborns with major congenital anomalies.



2.2. Statistical Analysis

Statistical Analysis was performed by using IBM SPSS statistics(Version20). Basic Descriptive statistics included means, Standard Deviations (SD), median Frequency and percentages. The chi-square test was used to study the relation between categorical variables. The information was presented in frequency tables and graphs.

3. Results

The research sample included 82 neonates born in Tishreen University Hospital in Lattakia during the time period extending from 8 July 2021 for a period of twenty months, and they had IUGR out of 1166 neonates born in that period who met the criteria for inclusion in the research.

Table 1. Prevalence of intrauterine growth restriction among neonates in tishreen university hospital in lattakia 2021-2023

The consequence	The number	The percentage
Existing	51	62.2%
Not existing	31	37.8%
The total	82	100%

We note from the previous table that the prevalence of intrauterine growth restriction in our research sample is 7.1%

Table 2. A sample of 82 neonates is distributed according to Gestational age groups among the neonates included in the study at tishreen university hospital in lattakia 2021-2023

IUGR	The Number	The Percentage
Existing	82	7.1%
Not existing	1084	92.9%
The total	1166	100%

We note from the previous table that 61% of the research sample studied were within the gestational age group 37-40 gestational week, and the gestational ages ranged between 30 to 40 gestational weeks, with an average of 36.75 ± 1.9 gestational weeks.

Table 3. A sample of 82 neonates is distributed according to birth weight in tishreen university hospital in lattakia, 2021-2023

The weight	The number	The percentage
≤5 percentile	63	76.8%
>5 percentile	19	23.2%
The total	82	100%

We note from the previous table that 76.8% of the studied research sample had weight less than or equal to the 5 percentile, and the weights ranged from 800 to 2400 g, with an average of 1775.3 ± 389.6 g.

Table 4. A sample of 82 neonates is distributed according to the classification of intrauterine growth restriction in tishreen university hospital in lattakia, 2021-2023

Gestational age	The number	The percentage
30 – 34	7	8.5%
34 – 37	25	30.5%
37 – 40	50	61%
The total	82	100%

We note from the previous table that 70.7% of the studied research sample had asymmetrical IUGR.

Table 5. Distribution of a sample of 82 newborns according to the incidence of consequences among neonates in tishreen university hospital in lattakia 2021-2023

Classification of IUGR	The number	The percentage
Symmetrical	24	29.3%
Asymmetrical	58	70.7%
The total	82	100%

We note from the previous table that 62.2% of the research sample studied had

Table 6. Distribution of a sample of 82 newborns according to the incidence of consequences among neonates in tishreen university hospital in lattakia 2021-2023

The consequence	The number	The percentage
Thermoregulation disorder	28	34%
Blood sugar disorder	23	28%
RDS	20	24.4%
Thrombocytopenia	14	17.1%
Neutropenia	12	14.6%
Perinatal asphyxia	11	13.4%
Hypocalcemia	8	9.7%
Anemia	6	7.3%
Seizures	5	6.1%
IVH	3	3.7%
PVL	2	2.4%

We note from the previous table that the most common consequences that occurred were a thermoregulatory disorder with a rate of 34%, followed by a blood sugar disorder with a percentage of 28% and respiratory distress syndrome with a percentage of 24.4%, noting that the child may have more than one complication.

Table 7. The relationship between the incidence of consequence and gender among the newborns included in the study at tishreen university hospital in lattakia 2021-2023

The gender	Consequence	No consequence	P-value
Male	20(55.6%)	16(44.4%)	0.08
Female	31(67.4%)	15(32.6%)	

We note from the previous table that no statistically significant differences exist between the incidence of consequence and gender.

Table 8. The relationship between the incidence of complication and the gestational age of the newborns included in the study at tishreen university hospital in latakia 2021-2023

The Classification of IUGR	Consequence	No consequence	P-value
Symmetrical	23(95.8%)	1(4.2%)	0.0001
Asymmetrical	28(48.3%)	30(51.7%)	

We note from the previous table that there are statistically significant differences between the incidence of complications and gestational age.

The percentage of complications increased with a decrease in the gestational age, as all newborns born at a gestational age between 30-34 weeks of pregnancy had complications, and it decreased to 72% in the gestational age group.

34-37 week and reached 52% with the category 37-40 week of pregnancy.

Table 9. The relationship between the incidence of complication and weight among the newborns included in the study at tishreen university hospital in latakia 2021-2023

The Gestational Age	Consequence	No consequence	P-value
30 – 34	7(100%)	0(0%)	0.02
34 – 36	18(72%)	7(28%)	
37 – 40	26(52%)	24(48%)	

We note from the previous table that there are statistically significant differences between the incidence of consequences and weight.

The percentage of complications increased with a decrease in weight, as the newborns weighed less than or equal to 5 percentile, the complications occurred at 74.6% of them, in contrast to the group of newborns with a weight of more than 5 percentile, the complications occurred only at 21.1% of them.

Table 10. The relationship between the incidence of complication and the classification of IUGR in the newborns included in the study at tishreen university hospital in latakia 2021-2023

The weight	Consequence	No consequence	P-value
≤5 percentile	47(74.6%)	16(25.4%)	0.0001
>5 percentile	4(21.1%)	15(78.9%)	

We note from the previous table that there are statistically significant differences between the occurrence of consequences and the classification of IUGR.

The percentage of consequences increased with the presence of Asymmetrical IUGR, where the consequences occurred in 95.8% of the cases of symmetrical versus 48.3% of the cases of asymmetrical IUGR.

4. Discussion

The prevalence rate of intrauterine growth restriction in neonates at Tishreen University Hospital during the study period was 7.1%. This percentage is high compared to the prevalence rate in Libya (1%), Zimbabwe (1.5%), and Latin America (5%) [6]. This may be due to increased risk factors in our society, the most important of which is maternal smoking during pregnancy and inadequate monitoring of high-risk pregnancies. The Complications were found more often in children with symmetrical IUGR because of the mechanisms underlying its early onset during pregnancy, in addition to their lower weight and smaller placenta size [11] [14].The ratio of PVL in the current study (2.4%) is close to 2.9% in the study of Von Beckeath and colleagues [8].The thermoregulatory disorder was the first among complications, as in Mitrovic and colleagues' study.

This may be due to the lack of adequate heating techniques (well-equipped reception rooms, transporting the child in incubators, covering the head, means of heating within the incubators...). The prevalence of cesarean delivery in our country also constitutes a factor that impedes the application of the approved heating series in developing countries, and its most important steps are early skin contact between the mother and the child, parental breastfeeding and the child staying with his parents [9] [13].Hypoglycaemia occurred in the current study in 28% of the IUGR neonates, which is close to the rate of 24% in Rocha and colleagues' study[10]. Anemia was 7.3% in the current study, lower than 23.7% in Harman and colleagues' study, due to our higher average weights[16].

The percentage of respiratory distress decreased among IUGR neonates in our study, which constituted 24.4%, from the rate of 36% among the general neonates in the incubators of Tishreen University Hospital. This is due to the effect of stress on accelerating lung maturity in IUGR neonates[7].The blood calcium in the current study was at a rate of 9.7% higher than in the study of Kavitha and colleagues, where it was 6%. This difference is due to the difference in the definition of hypocalcaemia between the two studies, where they adopted values less than 7 mg/dl for all newborns, while we adopted values less than 8 mg/dl at full-term newborns, in addition to the fact that the average weights of their newborns were higher than the average weights in our study[12].The high rate of asphyxia around birth contributed to an increase in the incidence of both thrombocytopenia and seizures, which occurred by 17.1% and 6.1%.Compared to rates of 10% and 2.3% in the studies of Rocha and Von Beckeath and their colleagues [8,15]. In the current study, we found that the rate of intraventricular hemorrhage was 3.7%. It is lower than similar studies such as Rocha et al.'s study by 12%. This is due to the formation of full-term newborns, the

largest proportion of our sample [10]. Among the significant blood disorders in neonates with IUGR was neutropenia, which occurred at a rate of 14.6%, while its general incidence rate in incubator admissions, according to the study of Gessler and colleagues, was 6%. The lack of neutropenia is explained by the role played by low weight in neonates of intrauterine growth restriction in hypoplastic hematopoiesis during uterine life[17,18].

5. Conclusion

The study showed a high prevalence of intrauterine growth restriction in neonates in Tishreen University Hospital. And the multiplicity of perinatal complications in one child. Thermoregulatory disorder was the most common complication, followed by hypoglycemia and respiratory distress syndrome.

Recommendations

Work as much as possible to prevent complications in IUGR newborns through a set of procedures that begin in the prenatal period, the most important of which is early

diagnosis. Moreover, immediately after birth, by providing suitable means of heating for the IUGR newborn and feeding it as early as possible.

Conducting a survey on a larger sample gives more accurate results about the close complications of intrauterine growth restriction.

Declarations

Ethical Consideration

After discussing the study with the parents, all of them gave complete and clear informed consent to participate in the study.

Availability of Data and Materials

Most of the data was in the article, and other data can be asked from the corresponding author.

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