

FREQUENCY OF OLIGOHYDRAMNIOS AND INTRAUTERINE GROWTH RESTRICTION (IUGR) IN HIGH-RISK PREGNANCIES

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Abstract

Objectives: Pregnancy complications include oligohydramnios and intrauterine growth restriction (IUGR). There isn't much local data on these conditions. Therefore, the purpose of this study is to evaluate the risk factors for working women's development of IUGR. In order to lower fetal-maternal morbidity and death, the study will contribute to the development of guidelines for women with these diseases.

Study duration: July to Oct 2025

Study type: Descriptive, cross sectional study. at Department of Obstetrics & Gynecology, Aziz Fatima Hospital, Faisalabad.

Methodology: Total 241 women between the ages of 18 and 40 who had a history of preterm labor, preeclampsia, or fetal growth restriction, as well as a high-risk singleton pregnancy were included. We excluded pregnancies that were complicated by medical conditions such as preeclampsia, severe anemia, liver and heart diseases, gestational diabetes, and PPROM. It was confirmed that oligohydramnios was present when the Amniotic Fluid Index (AFI) was less than 5 cm or the largest pocket in the broadest dimension was less than 2 cm. Birth weights falling between the 10th and 90th percentiles were categorized as appropriate weight for gestational age (AGA), while birth weights below the 10th percentile for gestational age were classed as intrauterine growth restriction (IGR).

Results: Mean age was 28.54 ± 5.93 years. Mean gestational age was 37.98 ± 2.31 weeks. A mean height of 159.78 ± 14.32 cm was recorded. 83.42 ± 9.29 kg was the average weight. Mean BMI was 31.52 ± 4.89 kg/m². Mean amniotic fluid index was 3.29 ± 0.89 cm. Mean maximum vertical pool was 1.07 ± 0.43 cm. Mean fetal weight was 2.89 ± 1.07 kg. Frequency of Oligohydramnios and Intrauterine Growth Restriction (IUGR) in high-risk pregnancies was found in 13 (5.43%) and 43 (17.84%) patients.

Conclusion: In high-risk pregnancies, oligohydramnios and intrauterine growth restriction (IUGR) occur often.

INTRODUCTION

An essential part of intrauterine fetal growth and development is the amniotic fluid that surrounds the fetus. It prevents umbilical cord compression, aids in temperature regulation, fosters lung

development, creates room for musculoskeletal growth, and aids in avoiding harm and the consequences of uterine contractions. Consequently, it is a crucial fetal development monitoring metric and a significant indicator of

fetal well-being.¹

A low volume of amniotic fluid in relation to gestational age is known as oligohydramnios. Three to five percent of pregnancies are affected by the disease. The severity of placental hypoperfusion and IUGR (Intra Uterine Growth Restriction) are typically correlated with the degree of oligohydramnios.^{2,3} Perinatal morbidity and mortality result from IUGR, a condition in which the fetus does not reach its genetic potential. It is frequently linked to oligohydramnios since both conditions have uteroplacental insufficiency. Compression of the umbilical cord, possible uteroplacental insufficiency, and a higher prevalence of oligohydramnios⁴ and meconium-stained amniotic fluid might all contribute to increased neonatal morbidity and mortality.⁴ Some recent research, however, has found no connection between isolated oligohydramnios and perinatal outcomes. The following outcomes are linked to decreased amniotic fluid volume and IUGR: meconium aspiration syndrome, stillbirth, increased labor induction, and neonatal death. Reduced urine output is the most frequent cause of oligohydramnios in IUGR babies.^{5,6} Chauhan et al. studied the prevalence of oligohydramnios and intrauterine growth restriction in high-risk patients. Of the 1859 singletons in total, 22% had probable IUGR, and 6% had oligohydramnios.⁷ Pregnancy complications include oligohydramnios and intrauterine growth restriction (IUGR). There isn't much local data on these conditions. Therefore, the purpose of this study is to evaluate the risk factors for working women's development of IUGR. In order to lower fetal-maternal morbidity and death, the study will contribute to the development of guidelines for women with these diseases.

MATERIALS AND METHODS:

This descriptive, cross-sectional study, which was approved by the ethical review committee, was carried out from July to September 2025 at the Department of Gynecology, Aziz Fatima Hospital in Faisalabad. Using the WHO sample size calculator, a sample size of 241 was determined with a confidence level of 5%, an expected proportion of 6% (7), and an absolute precision of

3%. Women between the ages of 18 and 40 who had a history of preterm labor, preeclampsia, or fetal growth restriction, as well as a high-risk singleton pregnancy (hypertension, diabetes, multiple gestations) and a gestational age of 28 to 40 weeks were included. We excluded pregnancies that were complicated by medical conditions such as preeclampsia, severe anemia, liver and heart diseases, gestational diabetes, and PPROM (preterm premature rupture of membranes).

Patients gave their written informed permission. The study comprised patients who met the inclusion criteria. Patient demographics and clinical characteristics, including age, parity, BMI, and gestational age, were recorded. Every necessary inquiry was completed. Every woman had a biophysical profile completed. It was confirmed that oligohydramnios was present when the Amniotic Fluid Index (AFI) was less than 5 cm or the largest pocket in the broadest dimension was less than 2 cm. Birth weights falling between the 10th and 90th percentiles were categorized as appropriate weight for gestational age (AGA), while birth weights below the 10th percentile for gestational age were classed as intrauterine growth restriction (IGR). A pre-made questionnaire was used to gather all of the data. SPSS 25.0 was used to analyze the data. Frequency percentages were computed for IUGR, oligohydramnios, parity, socioeconomic status, residency, hypertension, diabetes, and history of pregnancy problems including fetal growth restriction, preterm labor, or preeclampsia. Age, gestational age, weight, height, BMI, AFI, MVP, and fetal weight were all determined as mean $\pm$ SD. They used the chi-squared test. Age, gestational age, BMI, parity, socioeconomic position, and the impact on oligohydramnios and IUGR were all taken into consideration while stratifying. Using the post-stratification chi-square test, a p-value of less than 0.05 was deemed statistically significant.

RESULTS:

The study's participants ranged in age from 18 to 40, with a mean age of 28.54 ± 5.93 years. According to Table I, the majority of the patients,

123 (51.04%), were between the ages of 18 and 30 years. Distribution of different variables is shown in Table I. Mean gestational age was 37.98 ± 2.31 weeks. A mean height of 159.78 ± 14.32 cm was recorded. 83.42 ± 9.29 kg was the average weight. Mean BMI was 31.52 ± 4.89 kg/m². Mean amniotic fluid index was 3.29 ± 0.89 cm. Mean

shown in Table IV & V respectively

maximum vertical pool was 1.07 ± 0.43 cm. Mean fetal weight was 2.89 ± 1.07 kg. (Table II).

Frequency of Oligohydramnios and Intrauterine Growth Restriction (IUGR) in high-risk pregnancies was found in 13 (5.43%) and 43 (17.84%) patients (Table III). Stratification of oligohydramnios and IUGR with respect to confounders is

Table I: Distribution of different variables (n=241)

		Frequency	%age
Age (years)	18-30	123	51.04
	31-40	118	48.96
Gestational age (weeks)	28-36	87	36.10
	37-40	154	63.90
Parity	≤3	108	44.81
	>3	133	55.19
BMI	≤25	114	47.30
	>25	127	52.70
Residence	Rural	102	42.32
	Urban	139	57.68
Socioeconomic status	Lower	86	35.68
	Middle	79	32.78
	High	76	31.54
H/o preterm labour	Yes	93	38.59
	No	148	61.41
H/o pre-eclampsia	Yes	79	32.78
	No	162	67.22
H/o FGR	Yes	69	28.63
	No	172	71.37

Table II: Descriptive statistics

	Mean	SD
Age (years)	28.93	6.53
Gestational age (weeks)	37.98	2.31
Weight (kg)	83.42	9.29
Height (cm)	159.78	14.32
BMI (kg/m ²)	31.52	4.89
Amniotic Fluid Index (cm)	3.24	0.89
Maximum Vertical Pool (cm)	1.07	0.43
Fetal weight (kg)	2.89	1.07

Table-III: Frequency of Oligohydramnios and Intrauterine Growth Restriction (IUGR) in high-risk pregnancies (n=241).

Outcome	Yes	No
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Oligohydramnios	13 (5.39%)	228 (94.61%)
Intrauterine Growth Restriction	43 (17.84%)	198 (82.16%)

Table IV: Stratification of oligohydramnios with respect to confounders.

		Yes (n=13)	No (n=228)	P-value
Age (years)	18-30	08	115	0.436
	31-40	05	113	
Gestational age (weeks)	28-36	07	80	0.171
	37-40	06	148	
Parity	≤3	07	101	0.501
	>3	06	127	
BMI (kg/m ²)	≤25	04	110	0.219
	>25	09	118	
Residence	Rural	05	97	0.772
	Urban	08	131	
Socioeconomic status	Lower	04	82	0.891
	Middle	05	74	
	High	04	72	
H/o preterm labour	Yes	04	89	0.551
	No	09	139	
H/o pre-eclampsia	Yes	03	76	0.443
	No	10	152	
H/o FGR	Yes	05	64	0.420
	No	08	164	

Table V: Stratification of IUGR with respect to confounders.

		Yes (n=43)	No (n=198)	P-value
Age (years)	18-30	24	99	0.489
	31-40	19	99	
Gestational age (weeks)	28-36	22	65	0.023
	37-40	21	133	
Parity	≤3	18	90	0.667
	>3	25	108	
BMI (kg/m ²)	≤25	16	98	0.144
	>25	27	100	
Residence	Rural	21	81	0.340
	Urban	22	117	
Socioeconomic status	Lower	11	75	0.299
	Middle	17	62	
	High	15	61	
H/o preterm labour	Yes	24	69	0.010
	No	19	129	
H/o pre-eclampsia	Yes	27	52	0.0001
	No	16	146	

H/o FGR	Yes	19	50	0.013
	No	24	148	

DISCUSSION:

The majority of the mothers in this study (51.04%) were between the ages of 18 and 30. Among 415 women in a related study in central India, the majority of moms (97.4%) were between the ages of 19 and 34, with the remaining 2.6% being under the age of 18 or above the age of 35.⁸ In a different Nagpur research, 14 (6.54%) were teenagers and 141 (65.89%) were between the ages of 21 and 25.⁹ In our study, roughly 23% of the moms were younger than 19 at the time of their first pregnancy. More than half of the participants in a related research in Belagavi were married off as children, and 27% of them were under 19 when they became pregnant for the first time.¹⁰ The National Family Health Survey (NFHS) 4 (2015-2016) found that 7.9% of pregnancies are under the age of 19, and 26.8% of women had child marriages.¹¹

In our study, 35.68% of study participants were in the low socioeconomic class, followed by 32.78% in the middle class and 31.54% in the high class. In contrast, roughly 40% of participants in another study carried out in Kinaye were in the IV socioeconomic class, followed by III (39.56%), and the least number, 3.66%, were in class I.¹⁰ Approximately 57.68% of the mothers in this study lived in an urban environment. According to a comparable survey conducted in a rural part of Nagpur, 96.73 percent of the people lived in urban areas.⁹ Of the women in our study, 52.70% were obese. Given the complexity of high-risk pregnancy, most high-risk individuals have several high-risk factors that contributed to their condition. In this pregnancy, the primary risk factors were as follows: 12.2% of adolescent pregnancies; 9.8% of severe anemia cases; 8.6% of pregnancy-related hypertension and obesity cases; 6.1% of grand multigravida cases; 38.59% of preterm labor cases; 32.78% of pre-eclampsia cases; and 28.63% of h/o FGR cases.

In another Belagavi study, 55% of elderly primigravida, 3.2% were Rh negative, 22.3% had additional risk factors, 59.8% had a bad obstetric

history, 4% had PIH, and 30.7% of high-risk pregnant patients had these characteristics.¹⁰ PIH (16.6%), anemia (9.6%), and the occurrence of medical condition (10.3%) were identified as the main reasons of high-risk pregnancies in another study conducted in south India.⁸ The following elements were identified by the rural study conducted in Nagpur: Malpresentation 17 (7.94%), oligohydramnios, height <140 cm, weight <40 kg, history of stillbirth and associated conditions: 31 (14.49%), adolescent pregnancy 14 (6.54%), and pregnancy-induced hypertension. Pregnancy duration, history of congenital defects, history of more than or equivalent to two abortions, gestational diabetes, and age greater than 30 years in primigravida were all 2 (0.93%). There was one case of severe anemia and one of ectopic pregnancy (0.47%).⁹ Rh-negative blood types make roughly 7-10% of the general population.¹²

A prospective study of 415 pregnant women in central India found that 31% were at no risk, 46% were at low risk, and 59% were at high risk. With a high perinatal mortality incidence of 614 per 1000 live births, there were 59 perinatal fatalities in the high-risk group.⁸ In a different study carried out at Khammam, there was no correlation between an elevated maternal high-risk score and a higher perinatal mortality rate; all four perinatal fatalities and the prevalence of perinatal illness occurred in the high-risk group.¹³ In a different Belagavi study with 428 mothers, 40.2% of the patients were classified as high risk and 59.8% as low risk using Coopland's criteria. None of the ladies were considered to be at extreme risk. Anemia (10.7%), poor obstetric history (12.6%), thyroid problems (27.3%), and GDM (16.1%) were the most commonly cited risk factors.¹⁴ The Jain S et al.⁸ study showed similar results, showing that mothers in the low-risk group had a 50% lower incidence of high-risk neonates (41.3%) compared to mothers in the high-risk group (84.4%). In a rural study conducted in Nagpur,

142 study participants (66.36%) had low-risk pregnancies, whereas 33.64% had high-risk pregnancies, which were substantially linked to low birth weight and cesarean sections.⁹

A comparable study involving 700 participants, utilizing a modified high-risk scoring technique, determined that 67.3% of mothers were classified as low-risk, 20% as high-risk, and 12.7% as very high-risk. The study also found that using a scoring system to find high-risk pregnancies is helpful in finding women who are likely to have maternal and perinatal problems. For example, NICU admissions, low birth weight, maternal complications, and caesarean deliveries were more common in high risk women. A prospective cohort study involving 346 participants at a Nepali hospital found that 14.4% of pregnancies were high-risk. High-risk pregnant women were shown to be 4.2 times more likely than low-risk pregnant women to suffer severe maternal morbidities, according to the WHO definition for women with severe maternal morbidities. If regularly used for screening in prenatal care services, this risk scoring method shown its advantages in identifying serious maternal problems.¹⁵

In a retrospective cohort analysis of 533 pregnant women in Saudi Arabia, the significant increase in maternal and infant complications among high-risk mothers prompted the recommendation of a risk assessment strategy to mitigate adverse pregnancy outcomes through the early identification and management of high-risk pregnancies.¹⁶ A separate Canadian study (KAP) that emphasizes the role of physicians in encouraging folic acid consumption to avert negative pregnancy outcomes indicates that the present study illustrated that the practices of general health workers, have probably facilitated favorable pregnancy outcomes by mitigating adverse effects in the study region.¹⁷ The Coopland's criterion can also be easily used in a similar way because healthcare services have gone digital since COVID-19. This was shown in another recent qualitative study about pregnancy-induced hypertension (PIH) that was done in the Netherlands to look at the doctor-patient connection.^{18,19}

One of the study's weaknesses is that it only included high-risk pregnant patients from one tertiary care hospital, which represents a small portion of the population. As a result, extrapolating the findings to the whole community may be problematic. To learn more about high-risk pregnancy-related variables and pregnancy outcomes, further cohort studies are necessary.

CONCLUSION:

In high-risk pregnancies, oligohydramnios and intrauterine growth restriction (IUGR) occur often. The study emphasizes how crucial it is to identify pregnancies at high risk in order to improve outcomes. The necessity of focused interventions is highlighted by the prevalent risk factors. Reducing unfavorable outcomes in high-risk pregnancies requires improving prenatal care, early identification, and routine follow-ups.

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