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FREQUENCY OF PRETERM BIRTH IN MULTIPLE PREGNANCIES

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Abstract:

Introduction:

Preterm birth is a major health problem and leading cause of neonatal morbidity and mortality with high incidence all over the world. Preterm birth is the most common complication associated with multiple pregnancies. Multiple pregnancies have increased over the past decade due to the use of fertility drugs.

Objective:

To determine the frequency of preterm birth in multiple pregnancies

Study Design:

Cross sectional study.

Setting:

Department of Obstetrics & Gynecology women medical and dental college abbottabad

Duration of Study:

This study was conducted from 10th May 2021 to 10th November 2022.

Subjects and Methods:

A total of 196 pregnant women with multiple pregnancies were included in the study. A detailed explanation about the participation in the study was given to the patient and informed consent was obtained explaining the benefits of the study. Basic demographics like age, gestational age and weight, BMI along with the other data like number of fetuses, gender of fetuses, chronicity, amnionicity, mode of delivery, duration of labor, past history of preterm labor was recorded.

Results: Age range in this study was from 18 to 35 years with mean age of 28.469±3.05 years, mean gestational age 31.250±1.98 weeks, mean Duration of labour 11.413±4.23 hours, mean Birth weight 2.579±0.27 Kg, mean Cervical length 25.459±3.45 mm and mean BMI was 25.464±1.47 Kg/m^2. Preterm Birth was seen in 33.2% patients.

Conclusion: In conclusion, preterm delivery remains the most serious complication of multiple pregnancies.

Keywords: Pregnancy, Preterm birth, Frequency

INTRODUCTION

Preterm birth is a major health problem and leading cause of neonatal morbidity and mortality with high incidence all over the world. Preterm birth is the most common complication associated with multiple pregnancies. Multiple pregnancies have increased over the past decade due to the use of fertility drugs.

World Health Organization (WHO) has defined preterm birth as delivery before 37 weeks of gestation. About 1% of all births are multiple pregnancies and in Pakistan the rate of multiple gestation is 10.7/1000 live births (1). Twin pregnancies are high-risk and associated with increased perinatal morbidity and mortality. Prematurity is a main contributor, with 50% of twin pregnancies delivering before 37 weeks (2). The aetiology of preterm delivery in twin pregnancies is multifactorial and different from that of singletons (3). Uterine over distention is thought to induce preterm labor in women with twin and multiple pregnancies, but the pathophysiology remains unclear (3). The insertion of a cervical pessary was associated with a significant reduction in the Spontaneous Preterm Birth rate with sonographic short cervix (4). A meta-analysis indicates that cerclage placement is beneficial for the reduction of preterm birth and the prolongation of pregnancy in twin pregnancies with a cervical length of <15 mm or dilated cervix of >10 mm. However, the benefit of history-indicated or twin alone-indicated cerclage is less certain in twin pregnancies with normal cervical length according to current literature. Further high-quality studies were needed to confirm the findings (5).

The preterm birth is a major healthcare issue of global significance, so this study has been designed to determine the frequency of preterm birth in women with multiple pregnancies as literature does not reveal the study in terms of preterm birth related to multiple pregnancies in our population. Results of my study can benefit medical practitioners in their local practices as well as paves the way for further research of this complication in our local population. Results can also be used locally and internationally for references by researchers.

Materials and Methods:

This cross-sectional study was conducted in the Department of Obstetrics & Gynecology women medical and dental college abbottabad, from May 10th, 2021, to November 10th, 2022. The sample size of 196 women was determined using WHO software for sample size calculation, assuming a 95% confidence interval, a 50% anticipated proportion of women with multiple pregnancies, and an absolute precision of 7%. A non-probability consecutive sampling technique was employed. Women aged 18-35 years with multiple pregnancies confirmed by ultrasound were included in the study, while those with a cervical length less than 25 mm, antepartum hemorrhage, pregnancies complicated by TTTN/TRAP, refusal of informed consent, or any prenatal diagnosis of fetal malformation were excluded. Data were collected from eligible patients after obtaining ethical approval and informed consent. Demographic information, such as age, gestational age, weight, and BMI, along with details on the number of fetuses, gender, chorionicity, amnionicity, mode of delivery, duration of labor, and past history of preterm labor, was recorded on a structured Proforma.

Data Analysis Procedure:

Data was analyzed using SPSS version 17.0. Frequencies and percentages were computed for categorical variables like family history of preterm birth in multiple pregnancies. Mean ±SD was used for quantitative variables like age, gestational age, BMI, cervical length, chorionicity, amnionicity, birth weight, gender of fetuses, mode of delivery, duration of labor to see their effect on preterm birth. Post stratification chi square test was applied $p \leq 0.05$ was considered statistically significant.

RESULTS

Age range in this study was from 18 to 35 years with mean age of 28.469±3.05 years, mean gestational age 31.250±1.98 weeks, mean Duration of labour 11.413±4.23 hours, mean Birth weight 2.579±0.27 Kg, mean Cervical length 25.459±3.45 mm and mean BMI was 25.464±1.47 Kg/m^2. Frequency and %age of patients according to family history of preterm birth was 14.3%. Frequency and %age of patients according to chronicity, amnionicity, gender of fetus, modes of delivery are shown in Table-I.

Preterm Birth was seen in 33.2% patients as shown in Table-II.

Significant associations with preterm birth were observed for maternal age (p=0.014), cervical length (p=0.001), and chorionicity (p=0.001), indicating these factors may influence the likelihood of preterm birth. Other variables, including gestational age, duration of labor, birth weight, amnionicity, gender of the fetus, family history of preterm birth, BMI, and mode of delivery, did not show statistically significant associations with preterm birth, as reflected by their p-values (> 0.05). Table. III

Table- I: Descriptive statistics of demographic variables n=196

Demographics		**Descriptive statistics**	
Age(years)		28.469±3.05	
Gestational Age (weeks)		31.250±1.98	
Duration of labour (hours)		11.413±4.23	
Birth weight (Kg)		2.579±0.27	
Cervical length (mm)		25.459±3.45	
BMI (Kg/m^2)		25.464±1.47	
Gender of Fetus	Male	141	71.9%
	Female	55	28.1%
Family history of preterm birth	Yes	28	14.3%
	No	168	85.7%
Chorionicity	Monochorionic	101	51.5%
	Dichorionic	95	48.5%
Amnionicity	Monoamniotic	133	67.9%
	Diamniotic	63	32.1%
Mode of Delivery	Vaginal	133	67.9%
	C-section	63	32.1%

Table- II: Frequency and %age of patients according to Preterm Birth n=196

Preterm Birth	**Frequency**	**%age**
Yes	65	33.2
No	131	66.8
Total	196	100%

Table-III: Stratification of Preterm Birth with respect to effects modifiers n=196

Variables		**Preterm Birth**		**p-value**
		Yes	No	
Age	18-30 years	58(37.4%)	97(62.6%)	0.014
	>30 years	7(17.1%)	34(82.9%)	

	Total	65(33.2%)	131(66.8%)	
Gestational Age (weeks)	≤30	20(30.8%)	45(69.2%)	0.616
	>30	45(34.4%)	86(65.6%)	
	Total	65(33.2%)	131(66.8%)	
Duration of Labour (hours)	≤12	36(30.5%)	82(69.5%)	0.332
	>12	29(37.2%)	49(62.8%)	
	Total	65(33.2%)	131(66.8%)	
Birth weight (Kg)	≤2.5	31(32.6%)	64(67.4%)	0.878
	>2.5	34(33.7%)	67(66.3%)	
	Total	65(33.2%)	131(66.8%)	
Cervical length (mm)	≤25	48(50.5%)	47(49.5%)	0.001
	>25	17(16.8%)	84(83.2%)	
	Total	65(33.2%)	131(66.8%)	
Chorionicity	Monochorionic	58(57.4%)	43(42.6%)	0.001
	Dichorionic	7(7.4%)	88(92.6%)	
	Total	65(33.2%)	131(66.8%)	
Amnionicity	Monoamniotic	48(36.1%)	85(63.9%)	0.206
	Diamniotic	17(27%)	46(73%)	
	Total	65(33.2%)	131(66.8%)	
Gender of Fetus	Male	43(30.5%)	98(69.5%)	0.204
	Female	22(40%)	33(60%)	
	Total	65(33.2%)	131(66.8%)	
Family history of preterm birth	Yes	8(28.6%)	20(71.4%)	0.577
	No	57(33.9%)	111(66.1%)	
	Total	65(33.2%)	131(66.8%)	
BMI (Kg/m^2)	≤25	38(31.4%)	83(68.6%)	0.507
	>25	27(36%)	48(64%)	
	Total	65(33.2%)	131(66.8%)	
Mode of Delivery	Vaginal	43(32.3%)	90(67.7%)	0.719
	C-Section	22(34.9%)	41(65.1%)	
	Total	65(33.2%)	131(66.8%)	

Discussion

Multiple pregnancies are a serious complication of assisted reproductive techniques. Fifteen percent of twins and 60% of triplets and higher order births are the result of sub-fertility treatment in Great Britain.[6] The incidence of twin births at AFH rose by 46% between 1981 and 2001 (9.5/1000-14.1/1000).[7] This rise in incidence was similar to that reported from KKUH (10/1000-15/1000).[8] Multiple birth rates increase with increasing maternal age at first pregnancy (>30 years).[9] There is a worldwide shift towards bearing children at an older age. In the USA, 33% of all mothers giving birth in 1994 aged over 30-years as compared to 16% in 1984.[9] The increase of the rate of multiple births in our society was related to the use of sub-fertility treatment and increase in maternal age at first pregnancy. The rate of teenage mothers has shown a steady decline from 18.6% in 1979 to 5% in the year 2000.[10] Prophylaxis is always better than treatment. However, the prevention of naturally occurring multiple pregnancies is not possible. Reducing the number of medically induced multiple pregnancies is the most effective prevention of neonatal morbidity related to infertility treatments. Thirty-four percent of multiple pregnancies were induced in both institutions. Multiple pregnancies are regarded as a serious complication of assisted reproductive treatment cycles. Since the goal of infertility therapy is a healthy child, multiple gestations put that goal at risk. Prevention by using lower dosage gonadotrophin regimens remains the most important mean of decreasing multiple gestation rates. If there are more than 3 mature follicles, the cycle should be converted to an IVF cycle, or it should be canceled and intercourse should be avoided. In IVF cycles, the risk of multiple pregnancies is significantly increased when 3 embryos are transferred instead of 2.[11] The number of embryos transferred can be limited to 2 embryos without jeopardizing the pregnancy rate in most circumstances.[12] Assisted reproductive technology pregnancies remain to have poorer than usual outcome.[11] Compared to singleton births, fetal neonatal and perinatal mortality rates are 3-6 times higher in twins and 5-15 times higher in multiple births of higher order. The increase in the number of multiple births was associated with 3-4-fold increases in the risk of cerebral palsy for babies from multiple births. Cerebral palsy rates among survivals are 6 times higher in twins and 20 times higher in triplets.[12] Babies weighing <1500gm at birth have a 60 fold increase in the rate of cerebral palsy compared with babies weighing 2500 gm or more. Multiple gestations are high-risk pregnancies, which may be complicated by pre-maturity, low birth weight, pre-eclampsia, anemia, post-partum hemorrhage, intra-uterine growth restriction, neonatal morbidity and high neonatal and infant mortality. Multiple gestation children may suffer long term sequel of prenatal complications, including cerebral palsy and hearing disabilities. Toxemia of pregnancy was reported in (23.1%) of cases and anemia in (46.2%).[13] In an attempt to prevent the risk of premature birth in triplets and high order in multiple pregnancies, multifetal pregnancy reduction (MPR) is carried out. Unfortunately (MPR) had a limited effect as the proportion of pre-term deliveries and the prevalence of low birth weight in reduced pregnancies remained at the same level found in spontaneous twin or singleton pregnancy. The procedure itself is associated with the increased risk of miscarriage (7.6% for triplets, 13% for quadruplets, 17% for quintuplets and 21% for sextuplets or more) and premature rupture of the membrane and adverse psychological effects.[14] Embryo reduction should be used as a last resort.[15] More than 50% of patients with 3 or more gestational sacs had spontaneous reduction before 12 weeks. The surviving fetuses weighed less and were born earlier than unreduced pregnancies with the same initial number of fetuses.[16] The diagnosis of pre-term labor is perhaps one of the most difficult tasks facing obstetricians today due to the lack of understanding of the causes and patho-physiology of pre-term labor, and treatment modalities are aiming at symptoms rather than cause. Between 25-75% of pregnant woman suspected of having, premature labor will go on to deliver at term without intervention.[17] Neither oral nor intravenous betamimetics prophylaxis has shown effective in routinely preventing pre-term labor. Its use in active labor is associated

with an increased risk of pulmonary edema. Systematic corticosteroids between 28 and 34 weeks in triplet pregnancies will help in reducing the risk of hyaline membrane disease in infants of these pregnancies.[18] Corticosteroids were administered in only 27% of cases of multiple pregnancies. Cervical cerclage is indicated in selected cases. Cervical cerclage was applied in only 8% of cases. Bed rest is ineffective but will reduce the risk of developing hypertension and low birth weight. Reducing physical activity and standing at work in patients who have multiple gestations can prevent pre-maturity.[19] These data support the therapeutic interventions aimed at delayed delivery of subsequent fetuses.[20] There is little evidence regarding the best mode of delivery for women with multiple pregnancies. All triplets in both institutions are delivered by cesarean section. In selected cases, vaginal delivery of triplet gestations can be accomplished without increased maternal or neonatal morbidity and mortality.[21] Thirty to forty percent of all naturally conceived twins are monozygotic. Two thirds of these are mono-chorionic. Twenty-five percent of all twins are mono-chorionic di-amniotic. The perinatal mortality of monochromic is 5 times greater than di-chorionic ones and the morbidity is 8 times greater. The increase in morbidity is due to pre-maturity, cerebral lesions, congenital malformation, and twin-to-twin transfusion syndrome, which occurs in 10-30% of mono-chorionic twins.[22] The use of ultrasound in the first trimester allows us to diagnose number of multiples, chronicity, amnionicity, presence/ absence of nuchal translucency, early growth discordance, and severe malformation. In the second and third trimester, cervical assessment, early grading and treatment of twin-to-twin transfusion syndrome, diagnosis of malformation and growth disturbance, Doppler velocimetry, position of multiples, and decision of the optimal route of delivery.[23] A twin birth weight discordance of >40% before 32 weeks' gestation has clearly been demonstrated to be a risk factor for pre-term birth.[24] A trans-vaginal ultrasonic measurement of the cervix >35mm at 18-24 weeks in twin gestation can identify patients at low risk for delivery before 34 week.[25] A shorter cervix measured before and not after 30 weeks' gestation was a stronger predicator of pre-term delivery. When maternal weight gains of 40-45 pounds were achieved, good outcome for both twins weighing >2500g were reported. A weight gain of <0.85 pounds/week before 24 weeks was significantly associated with poor intrauterine growth and higher morbidity among twins regardless of subsequent rate of gain.[2]

Conclusion:

In conclusion, preterm delivery remains the most serious complication of multiple pregnancies. Multiple gestation children may suffer long term sequel of prenatal complications, including cerebral palsy and hearing disabilities. Every effort should be made to reduce the risk of multiple gestation and pre-term labor through proper control of and close monitoring of fertility drugs, limiting number of embryo transfer to a maximum of 3 or only 2, improve the socioeconomic status of maternal mothers, reduce cigarette smoking, relieve maternal stress, restriction of maternal activity, frequent contact with health care personnel and treatment of any obstetric or medical disorders.

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