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STUDY TO FIND THE FREQUENCY OF MATERNAL RISK FACTORS IN PRETERM NEONATES

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Abstract:
Objective: The objective of the study is to find the frequency of maternal risk factors in preterm birth.
Study Design: Descriptive - Cross sectional study
Place and Duration of Study: This study was undertaken at the Service Hospital Lahore from January 2017 to December 2018.
Materials and Methods: All preterm neonates were examined at Services Hospital Lahore. Mothers who delivered neonates before 37 weeks gestation period were registered. The prevalence was 14.9%[1], the unavoidable error was 5%, assurance interval 95% and the sample size was 195. The sampling was Non-probability and consecutive.
Results: 195 mothers were included in the study who delivered preterm neonates. Out of 195 patients, anaemia was found as a common risk factor for preterm delivery in 50.8% mothers, followed by history of previous abortion and premature rupture of membrane with 23.0% and 13.8% respectively. History of previous preterm delivery, pre-eclampsia and antepartum haemorrhage were the least reported risk factors at 4.1% each in our study.
Conclusion: Early detection of the most common maternal risk factors as: nutritional status of women (BMI), previous abortions and previous preterm births will reduce the prematurity rate, medical cost and suffering of the parents. Prematurity remains a huge problem in Pakistan.

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Please cite this article in press Huzaifa Saleem et al., **Study to Find the Frequency of Maternal Risk Factors in Preterm Neonates.,** *Indo Am. J. P. Sci, 2019; 06(01).*

INTRODUCTION:

Preterm birth (PTB) is one of the leading causes of infant mortality around the globe and has long term health issues[1-3]. The definition of preterm birth as defined by World Health Organization (WHO) is any birth that has not completed weeks of gestation that is less than 259 days [1].

In 2005, WHO estimated 13 million infants were born before 37 completed weeks of gestation while in 2010, the global average preterm birth was 11.1%, giving a worldwide total of 14.9 million. Approximately 85% or 11 million of these preterm births are concentrated in Asia and Africa [4,5]. Annually, preterm birth is directly responsible for an estimated one million neonatal deaths. Prematurely born children are prone to a number of problems in their later life including retinopathy [6] cerebral palsy [7] jaundice, [8] infections [9] sensory deficits, learning disabilities and respiratory illness [10].

The maternal risk factors include urinary tract infection during pregnancy, abruptio-placentae, polyhydramnios, preterm rupture of membranes, intrauterine death in women who are older than 35 [11] maternal smoking [12] diabetes mellitus and hypertension in pregnant women [13] High body mass index (BMI) contributes in preterm delivery [14].

In a study, common maternal risk factors associated with preterm birth were hypertensive disorders of pregnancy (21.4%), height <1.50m (16.8%), premature rupture of membranes (17.5%), and fetal distress (14.9%). Mean birth weight for preterm babies was 2452 grams while the birth weight for term babies was 2978 grams [1].

Another study showed a significant increased risk of preterm birth (PTB) in women with body mass index (BMI)>25, women employed in heavy work, history of previous abortion or previous caesarean section was positively correlated to the increased risk of PTB [15].

The demanding proposal nowadays is the reduction of preterm birth since the cause, in many situations, is hard to get hold of. The women at-risk should be identified by their risk factors for preterm birth is important for targeting the services and initiation of risk-specific interventions.

MATERIALS AND METHODS:

The single centre observational cross-sectional study was carried out in Services University Hospital, Lahore. The criteria for inclusion were: mothers having less than 37 weeks of gestation. The data was collected form Gynae and Obstetrics unit and Paediatric department of Services Hospital Lahore. The baseline characteristics such as maternal age, nutritional status of mother (BMI), gravida as well as maternal risk factors such as anaemia, history of previous abortion, premature rupture of membranes, history of previous preterm delivery, preeclampsia, ante partum haemorrhage and maternal smoking were recorded in predesigned questionnaire. The gestational age was confirmed by ultrasound. Anaemia was assessed by haemoglobin <10 g/dl. The collected data was analysed by using SPSS version 17. Frequencies and percentages were calculated for qualitative variables i.e. maternal age groups (years), maternal body mass (BMI), maternal gravida, anaemia, history of previous abortion, premature rupture of membranes, history of previous preterm delivery, preeclampsia and ante partum haemorrhage. Stratification was done with regards to maternal age and nutritional status of mother (BMI) to see the effect of these modifiers on outcome of interest by using chi square test and considering $p \leq 0.05$ as significant.

RESULTS:

During the study period 195 mothers were included who delivered preterm neonates at Services hospital Lahore. Using the age group, 79(40.5%) subjects aged less than 25 years, 76(38.9%) between 25 to 35 years and the remaining 40(20.5%) aged more than 35 years. Based on nutritional status, majority of the mothers i.e. 110(56.4%) were found to have BMI lower than 20 while remaining 85(43.6%) had BMI greater than 20. A detailed obstetric history was also obtained from every woman. Results revealed that, 62(31.8%) mothers were primigravida, 78(40.0%) had gravidity between 2 and 5, while remaining 55(28.2%) mothers had gravidity greater than 5 (Table 1).

The maternal risk factors reported in this study were anaemia, history of previous abortion, premature rupture of membrane, history of previous preterm delivery, pre-eclampsia and antepartum haemorrhage. Anaemia was found as the most common risk factor for preterm delivery with 50.8%, followed by history of previous abortion and premature rupture of membrane with 23.0% and 13.8% respectively. History of previous preterm delivery, pre-eclampsia and antepartum haemorrhage were the least reported risk factors at 4.1% each as shown in Table 2.

Table No.1: Maternal Characteristics (n=195)

	Number	Percent (%)
Maternal Age (years)		
< 25 years	79	40.5
25 – 35 years	76	38.9
> 35 years	40	20.5
Maternal Body Mass Index (BMI)		
< 20	110	56.4
>20	85	43.6
Maternal Gravida		
Primigravida	62	31.8
2-5	78	40.0
>5	55	28.2

TableNo.2: Maternal risk factors (n=195)

Risk factor	Number of cases	Percent (%)
Anaemia	99	50.8
History of previous abortion	45	23.0
Premature rupture of membrane	27	13.8
History of previous preterm delivery	8	4.1
Pre-eclampsia	8	4.1
Antepartum haemorrhage	8	4.1
Total	195	100

Significant association between mother's BMI status and different maternal risk factors were observed at 5% significance level. Results revealed that anaemia (p value=0.008), history of previous abortion (p-value=0.016) and premature rupture of membrane (p- value=0.023) were associated with BMI lower than 20. However, no such association was observed between lower BMI and other risk factors including history of previous preterm delivery (p-value=0.721), pre-eclampsia (p-value=1.0), antepartum haemorrhage (p-value=0.722).

Furthermore, maternal age was also significantly associated with common risk factors found in this study. Results revealed that anaemia (p-value= 0.05) and history of previous abortion (p-value=0.001) were associated with maternal age > 35 years. However, no such association was observed between mother's age and other risk factors including premature rupture of membrane (p-value=0.097), history of previous preterm delivery (p-value=0.864), pre-eclampsia (p-value= 0.902), antepartum haemorrhage (p-value=0.902). (Table 3).

Table No.3: Association of maternal risk factors with maternal age groups and maternal body mass index groups (BMI)

Risk factor	Maternal Age (P-value)	Maternal BMI (P-value)
Anaemia	.05*	.008**
History of previous abortion	.001**	.016*
Premature rupture of membrane	.097	.023*
History of previous preterm delivery	.864	.0721***
Pre-eclampsia	.902	1.0***
Antepartum haemorrhage	.902	.722***

DISCUSSION:

The management cost of preterm neonates, plus the long term management, is considerably high in underdeveloped countries.

In our study, maternal characteristics i.e. poor nutritional status, maternal age, gravidity and maternal common risk factors which include history of previous abortion, history of previous preterm delivery, anaemia, premature rupture of membrane, pre-eclampsia and antepartum haemorrhage were incorporated which increase the risk of preterm birth. The maternal characteristic in our study i.e. maternal age, we found that 40.5% mothers were under the age of 25 years. This finding is in agreement with other report [6]. Maternal malnutrition status is another characteristic that cause preterm delivery. In our study maternal malnutrition i.e. BMI less than 20 (56.4%) is constant with study by Mohsinal S [17]. Another maternal characteristic is gravidity which is not included as a major factor in our study while in other numerous studies this factor is considered influential for pre term delivery [18,19].

Basically the highly prevalent maternal risk factors play significant role in preterm delivery. In our study, the most frequent maternal factor was anaemia 50.8%, which was comparable with other studies [14,18,19]. History of previous abortions has also reported as a contributory factor in other studies while in our study its prevalence was 23% [20]. In our study 13.8% mothers had history of premature rupture of membrane while it was 78% as reported in a study conducted by Mink [21]. Previous history of preterm delivery was 4.1% in our study while this finding is again inconsistent with other studies [22,23]. Other factors like antepartum haemorrhage and Preeclampsia, were not included as contributory factors in our study which was again inconsistent with other studies [24].

In this study, maternal risk factors i.e. anaemia (p value=0.008), history of previous abortion (p-value=0.016) and premature rupture of membrane (p-value=0.023) were associated with BMI less than 20. Maternal age was also significantly associated with common risk factors found in this study. Results revealed that anaemia (p-value= 0.05) and history of previous abortion (p-value=0.001) were associated with maternal age >35 years while these findings were also consistent with other study [5].

The number of preterm delivery incidents are increasing, and the most probable reason could be unaware mothers.

CONCLUSION:

Timely detection of common maternal risk factors as: previous abortions, nutritional status of women (BMI) and previous preterm births will reduce the prematurity rate, medical cost and suffering of the parents.

The women must be encouraged to seek antenatal care from qualified health care professionals and the maintenance of good nutrition during the pregnancy could help lessen the major risks involved.

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