Original Article

Maternal Risk Factors in Preterm Neonates

Maternal Risk Factors

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ABSTRACT

Objective: To study the frequency of maternal risk factors in preterm birth.
Study Design: Descriptive - Cross sectional study
Place and Duration of Study: This study was carried at Hamdard University Hospital, Karachi from January 2013 to December 2013
Materials and Methods: All preterm neonates were examined at Hamdard University Hospital. Mothers who delivered neonates before 37 weeks of gestation and their suspected maternal risk factors contributing to preterm labor were registered on a pre-designed proforma. Keeping prevalence of 14.9%[1], bound of error 5%, confidence interval 95%, the calculated sample size is 195. There was Non-probability consecutive sampling. Mothers who delivered live born babies in Hamdard hospital Karachi before 37 weeks of gestation. Babies were born after 37 weeks of gestation and still birth.
Results: During the study period, 195 mothers who delivered preterm neonates were included. Out of 195 patients, anemia was found as most 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 hemorrhage were the least reported risk factors at 4.1% each in our study.
Conclusion: Prematurity is still a major problem in Pakistan. Early detection of the most common maternal risk factors as: nutritional status of women (BMI), previous abortions, previous preterm births will reduce the prematurity rate, medical cost and suffering of the parents.
Key Words: Newborn, Prematurity, Maternal Risk Factors.

INTRODUCTION

Preterm birth (PTB) is the leading cause of infant morbidity and mortality in the world and has long term consequences for health.[1-3] The World Health Organization (WHO) defines preterm birth as any birth before 37 completed weeks of gestation or fewer 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 11 million (85%) of these preterm births are concentrated in Africa and Asia.[4,5] Basically, preterm birth is directly responsible for an estimated one million neonatal deaths annually and it is also an important contributor to child morbidities. Children who are born prematurely, accounts for a number of problems in their later life including retinopathy of prematurity,[6] cerebral palsy,[7] jaundice,[8] infections,[9] sensory deficits, learning disabilities and respiratory illness.[10]

The maternal risk factors like age >35 years, urinary tract infection in pregnancy, abruptio-placentae, polyhydramnios, preterm rupture of membranes, intrauterine death,[11] maternal smoking,[12] diabetes mellitus and hypertension among pregnant women are leading causes of preterm delivery.[13] High pregravid body mass index (BMI) is also an important contributing factor 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 cesarean section was positively correlated to the increased risk of PTB.[15]

The reduction of preterm birth is a demanding proposal nowadays since the cause, in many situations, is hard to get hold of. The aim of this research was to determine the frequency of possible maternal risk factors which lead to preterm deliveries in patients delivered at the tertiary care hospitals of Karachi and the results of the study would help to give attention to the highly prevalent maternal risk factors. Early Identification of at-risk women and their risk factors for preterm birth is important for targeting the services and initiation of risk-specific interventions. Study of risk factors might

also provide important insights leading to new discoveries for prevention and management of preterm births.

MATERIALS AND METHODS

The single centre observational cross-sectional study was carried out in Hamdard University Hospital, Karachi. Approval for the study was taken from the Institutional Ethical Committee. The main criteria for inclusion were: mother who had delivered babies before 37 weeks of gestation during study period. The source of data had been taken form Gynae and Obstetrics unit and Paediatric department of Hamdard University Hospital Karachi. The baseline characteristics such as maternal age, nutritional status of mother (BMI), gravida as well as maternal risk factors such as anemia, history of previous abortion, premature rupture of membranes, history of previous preterm delivery, preeclampsia, ante partum hemorrhage and maternal smoking were recorded in predesigned proforma. The gestational age was assessed by using date of last menstrual period and confirmed by ultrasound. Anaemia was assessed by haemoglobin <10 g/dl. The collected data was analyzed 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, anemia, history of previous abortion, premature rupture of membranes, history of previous preterm delivery, preeclampsia and ante partum hemorrhage. 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 hamdard hospital Karachi. On the basis of age group, 79(40.5%) mothers were less than 25 years of age, 76(38.9%) were between 25 to 35 years of age while remaining 40(20.5%) were greater than 35 years of age. 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 anemia, history of previous abortion, premature rupture of membrane, history of previous preterm delivery, pre-eclampsia and antepartum hemorrhage. Anemia 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 hemorrhage 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 (%)
Anemia	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 hemorrhage	8	4.1
Total	195	100

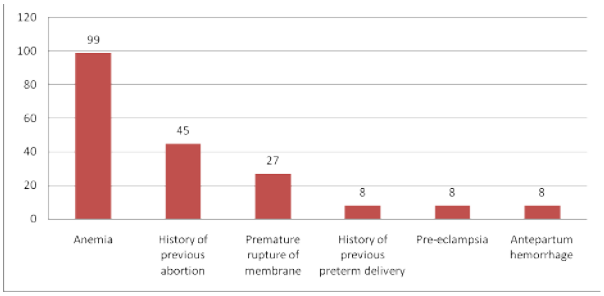

Figure No.1:Maternal Risk Factors

Significant association between mother's BMI status and different maternal risk factors were observed at 5% significance level. Results revealed that anemia (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 hemorrhage (p-value=0.722).

Furthermore, maternal age was also significantly associated with common risk factors found in this study. Results revealed that anemia (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 hemorrhage (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)
Anemia	.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 hemorrhage	.902	.722***

* Significant at 0.05 level
** Significant at 0.01 level
*** Not Significant at 0.05 level

DISCUSSION

Preterm neonates are major cause of perinatal morbidity and mortality. The management of these neonates, including the long term management, cost is considerably high in underdeveloped countries.

In our study, maternal characteristics i.e. maternal age, poor nutritional status, gravidity as well as maternal common risk factors i.e. anemia, history of previous abortion, premature rupture of membrane, history of previous preterm delivery, pre-eclampsia and antepartum hemorrhage were included 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 malnutritional status is another characteristic that cause preterm delivery. In our study maternal malnutrition i.e. BMI below 20 (56.4%) is consistent with study by Mohsinal S.[17] Another maternal characteristic gravidity is not a major factor in our study while in other studies maternal gravidity is considered as a contributory factor 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 anemia 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 Pre eclampsia, antepartum hemorrhage were not a contributory factor in our study which was again not consistent with other studies.[24]

In our study, maternal risk factors i.e. anemia (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. Maternal age was also significantly associated with common risk factors found in this study. Results revealed that anemia (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 deliveries are increasing, and the possible reason could be that mothers are not aware of the risk factors that could lead to this condition. Efforts should be made through public awareness programmes about the possible risk factors of preterm delivery.

CONCLUSION

Prematurity is still a major problem in Pakistan. Early detection of the most common maternal risk factors as: nutritional status of women (BM)I, previous abortions, previous preterm births will reduce the prematurity rate, medical cost and suffering of the parents.

In resource poor settings with high burden of preterm birth, the women should be encouraged to seek antenatal care from qualified health providers and to maintain good nutritional status during the pregnancy.

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