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Research article

EVALUATION OF RISK FACTORS FOR PRETERM DELIVERY AND CREASY'S RISK SCORING

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ABSTRACT

Background: Preterm birth is a poorly understood domain so it is a one of the most serious problem encountered in case of pregnant women. Because of the incomplete knowledge of biochemical and molecular reasons for preterm birth, many authors have shown interest in various predicting risk factors of preterm birth. **Aim:** This study was undertaken to know risk factors for preterm delivery and to investigate the usefulness of the most widely used creasy scoring system in identifying the high risk group of women at the tertiary care center of India. In this study also included observation of perinatal mortality and morbidity associated with preterm deliveries. **Material and Methods:** In the present study of 175 women who gave birth to preterm babies, detail history was taken. Then all the Data were statistically analyzed based on percentage. **Result:** Preterm delivery is particularly affected by precipitating of some risk factors (Hb, weight, parity of mother etc.). **Conclusion**: so we can say that such risk factors acting as a precipitating factor for preterm deliveries. Awareness of such risk factors is essential to plan public education programs and to consider appropriate perinatal care options for women at potentially higher risk for preterm delivery.

Keywords: Preterm birth, Creasy scoring, Perinatal death

INTRODUCTION

One of the most important unresolved issues currently confronting obstetricians is the prevention of preterm birth (birth before 37 completed weeks of gestation). Preterm birth is, worldwide, the most challenging problem in obstetrics, but the prevention of prematurity has been difficult and ineffective because of its multifactorial and partly still unknown etiology. Identification of those women who are likely to deliver before term requires use of simple diagnostic tools that can be applied to both asymptomatic and symptomatic pregnant women. [1] Many healthcare providers collect data on pregnant women for assessment of preterm birth risk. Current technology makes possible collection of a plethora of data, yet a perinatal healthcare provider has no access to a general, reliable and valid method of preterm birth assessment. [2] Babies born before the 34th week of pregnancy, have the highest risk for early death and enduring health problems, but recent research has shown that even preterm infants (at 34 to 36 weeks of pregnancy) have greater health risks than full-term babies. [3]

The treatment of preterm labor, preterm delivery, and premature birth are not only major problems in obstetrics and pediatrics but also have major economic, psychological, and social impact. Most existing methods to assess preterm birth are based on risk scoring, done manually. These methods are

between 17% and 38% predictive in determining preterm birth. This range of accuracy is obviously not satisfactory. Some authors conclude that-in general-manual risk screening tools are not sufficient to be used in the prediction of preterm labor. [2] To improve the outcome of these very preterm neonates, we need to expand our knowledge of the etiology, prevention, and treatment of preterm labor and preterm delivery. However, the rate of preterm delivery has not decreased in the past 30 years Goldenberg *et al*., 2008, mainly because of failure to identify the high-risk group during routine prenatal care. [4] To identify women at risk of spontaneous preterm birth, clinicians use prior preterm birth, multiple pregnancy and prior cervical surgery as major risk factors. Useful clinical risk factors in predicting spontaneous preterm birth in nulliparous women with a singleton pregnancy are scant, except for a history of prior cervical surgery. [5]

So the present study was with the aim of first, to see the effectiveness of the routine creasy risk scoring system in predicting the high risk group in local population and second, to find out the common high risk factors like Hb, weight, parity of mother associated with preterm labor.

MATERIALS AND METHODS

The department of Obstetrics and Gynecology, of Shri M. P. Shah Govt. Medical College and Guru Govindsinh General Hospital, Jamnagar, carried out the present study. Informed consent was taken from all individual subjects included into the study. In the present study of 175 women, who gave birth to preterm babies (in 1 yr duration) were included and classified as at low, medium or high risk for preterm labor according to the Creasy scoring system which is based on socioeconomic factors, previous medical history, daily habits, as well as aspects of the current pregnancy. [6] This scoring system is extensively used to identify preterm delivery. Socioeconomic class is assessed by Prasad's social classification. All other term pregnancy was excluded from the study. The gestational age was assessed from the date of last menstrual period, provided she had regular ovulatory cycle previously. In others, clinical examinations like fundal height date of quickening, appreciation of fetal heart by stethoscope and ultrasonographic measurements were used for gestational age determination. Anthropometric measurements of the mother including weight, height were carried out by using standard techniques. Other data of socioeconomic status, personal history, past medical surgical, obstetric history and prenatal care were collected by interviewing the patients. Hospital records were also abstracted for relevant data and used for cross-check the reliability of information obtained during the interview.

Physical examination, Blood pressure and hemoglobin by standardized acid haematin method were also done. Anemia in this study was defined as hemoglobin < 10 g/dl on one or more occasion. Chronic or pregnancy induced hypertension was defined as a blood pressure greater than 140/90 mmHg repeatedly, and, if the women also had proteinuria than pre-eclampsia was considered to exist. After delivery the newborn was examined within 6 hours and fetal maturity was assessed. Then all the Data were statistically analyzed based on percentage.

RESULTS

Finding of the present study are as under –

First the relationship with the age of mother (in yrs) and preterm delivery compared, in that the age group are divided in < 20 yrs, 21-25 yr, 26-30 yr, 31-35 yr, 36-40 yrs and >40 yrs, out of them majority of preterm delivery was noticed in 21-25 yrs of age group. That is of 87 out of 175 preterm deliveries. Then the incidence was gradually declined with increase age. Then relationship with the gestational age of mother (in wks) and preterm delivery compared (Table 1), in that most of the preterm deliveries occurred in 31-34 weeks of pregnancy.

Table: 1 Relationship of Gestational age with Preterm delivery.

Gestational age (in wks)	No of preterm delivery (out of 175)	Percentage
<30	19	10.8 %
31-34	85	48.5 %
35-37	71	40.7 %

Then out of 175 preterm delivery, 76 were primi while 99 are multipara in that 94 were multipara and 05 were grand (>4) multipara. One of the important relationships of weight and preterm delivery (Table 2), in that 153 preterm delivery seen in < 55 kg wt

(out of them 28 have < 45 kg wt) and only 22 have preterm delivery with more than 55 kg weight.

Table: 2 Relationship of Maternal Weight and Preterm delivery.

Maternal Weight (in Kgs)	No of preterm delivery(out of 175)	Percentage
< 45	28	16 %
45-55	85	71.4 %
>55	22	12.6 %

In relation to the antenatal care 118 were unbooked and 57 were booked. In our study approximately 49% births were females and 51% males. According to socio economical class (Table 3), majority of preterm delivery was noticed in low socioeconomic class (84.57%) and that is of 148 out of the 175, and remaining 15.43% from middle class.

Table: 3 Relationship of Socioeconomic class and Preterm delivery.

Socioeconomic Class	No of preterm delivery(out of175)	Percentage
High	-	-
Middle	27	15.4 %
Low	148	84.6 %

In the present study of preterm delivery, 19 cases of PET – pre eclamptic toxemia, 18 cases of PROM - premature rupture of membrane, 18 cases of APH (ante partum haemorrhage), 13 cases of twin pregnancy, 11 cases of UTI - urinary tract infection, 07 cases of Eclampsia were noticed. While some cases of fever, heart disease, cerebral malaria, hydroamnios, jaundice, anemia, congenital anomalies, uterine anomaly and uterine prolapsed. And 62 are from the unknown reason. In this study out of 175, 13 were twin delivered.

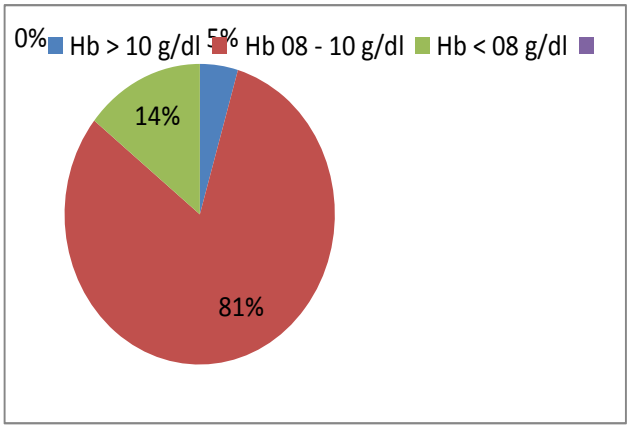

Fig1: Relationship of Hb level and Preterm deliveries.

According to Hb (Fig. 1) only 8 women have preterm delivery with Hb > 10 g/dl, and rest of the women with Hb level < 10 g/dl (in that 25 have Hb < 8.0 g/dl).

According to past history 29 have previous h/o of abortion, 20 have H/o preterm delivery and 09 have previous H/o both.

In this study, according to creasy risk scoring system (primi + multi) (Table 4), in that (31 +3 = 34 in low risk), (21 + 8 = 29 in medium), (24 + 88 = 112 in high risk).With twin pregnancy (175 + 13 = 188) child born. Out of them 49 were still birth, 55 neonatal deaths and hence making 104 prenatal deaths.

Table: 4 Creasy scoring and distribution by Parity.

Gravida	Low risk	Medium risk	High risk	Total
Primi	31	21	24	76
Multi	03	08	88	99
Total	34	29	112	17

DISCUSSION

The importance of preterm delivery as a major public health problem is easily demonstrated by virtue of its contribution to total perinatal mortality contributing 50% to 70% of all perinatal deaths in most data sets.[7] Early detection of preterm labour is difficult because initial symptoms and signs are often mild and may occur in normal pregnancies. Thus, many healthy women will report symptoms during routine prenatal visits, whereas others destined for preterm birth may dismiss the early warning signs as normal in pregnancy. The traditional criteria for preterm labour (persistent contractions accompanied by progressive cervical dilatation and effacement) are most accurate when contraction frequency is six or more per hour, cervical dilatation is 3 cm or more, effacement is 80% or more, membranes rupture, or bleeding occurs. [8] Though preterm birth occurs in approximately 5-15% of all deliveries, it accounts for the major bulk of perinatal and especially postnatal deaths. The risk of neonatal morbidity and mortality mainly depends on the gestational age at delivery. Survival rate increases with an increasing period of gestation. In a developing country like ours, where intensive care facilities are often unavailable, mortality figures would be much higher at a lower gestation period at delivery. [1] Some biochemical markers like fetal fibronectin, the thrombin cascade,

and maternal salivary estriol measured in asymptomatic women with and without risk factors for preterm birth. [8]

In our study majority of preterm births were in mothers of age group 21-25 years and that was gradually decreasing with increasing age. It is comparable to many similar studies like Molly Phillip et al. and Trivedi et. Al. inspite of very high incident of prematurity among teenage patients, the total number of patients in this group remains low because of decreasing trend of teenage marriage and late age of marriage. Higher incident of prematurity in the older patients is likely to be due to malnutrition, anemia, increase physical work load and increased incidence of medical and obstetric complications. [9]

Also presence chorioamnionitis, bacterial vaginosis, urinary tract infection were significantly associated with preterm labor. [10] Fibronectin, an extracellular matrix protein, acts as the "glue" that attaches the fetal membranes to the underlying uterine decidua. A positive fibronectin test (50 ng/mL or more) in a patient with symptoms suggestive of preterm labor has been associated with an increase in the likelihood of birth before 34 weeks and birth within 7–14 days of the test. [8]

In our study preterm birth in primipara, multipara and grand multipara were 43.4%, 53.7% and 2.95% respectively. This result is somewhat similar to other work reported on this aspect. [11] In grand multipara it is combined effect of parity, preexisting poor maternal nutrition, anemia less spacing between two pregnancies, lack of antenatal care, associated medical and obstetric complication etc. also play a role. The distributions of preterm births by gestational age observed in the present study are quite comparable to those of jose et.al. [10, 11]

The delivery probability profile incorporates data on fetal fibronectin, cervical length by ultrasound and a past history of preterm delivery to generate standard pregnancy survival curves. This information might also help in developing patient-specific strategies to help prevent prematurity. [12]

It is observed that almost 87.5% preterm births were from mothers with pregnancy weight of less than 55 kg. in another study from India 52.5% preterm births were in mothers having weight of less than 45 kg. Pre-pregnancy weight of mother and weight gain during pregnancy also affects the birth weight. [13]

The effect of regular antenatal care on the incidence of preterm birth observed in the present study is compared with some of the other studies. Incidence of preterm birth is markedly less in booked cases as compared to unbooked cases (who attended less than 3 antenatal care or none). Greenberg noted that prenatal care had a greater impact on pregnancy outcome in socially disadvantages women, a group of women who often obtain less prenatal care. [14] The prevention can be based on at risk approach – (a) Patient at high risk of preterm labour should be monitored carefully and (b) Patient with warning signs will go through prophylactic treatment like antibiotics, tocolytics, bed rest etc. to prevent preterm birth.

The higher frequency of preterm births in lower social class might have been due to a number of factors. More than two thirds of the patients admitted to our hospital are from these social classes. Secondly those who are economically at disadvantages might be worse off as regards health, physique, knowledge and nutrition. Present study data and that reported by other studies clearly indicate that socio-economic status has got direct and profound influence in the preterm labor and birth. [15, 16, 17]

Anemia has been documented to result in higher incidence of low birth weight babies as well as higher preterm births. Anemia could lead to T and B cell suppression and resulting immune suppression could lead to increased susceptibility to infection. [18] Similar results are also reported by kandeparker et al. with 54% cases having Hb less than 10.0 g%. [11]

In agreement with other studies [19] we found that history of previous abortion and previous preterm delivery increase the risk of preterm delivery in next pregnancy.

The ability of creasy's score in predicting Preterm birth is significant but it also has its limitations when applied in Indian context, where no. of other parameters do play a major role in predicting Preterm birth. This study present that maternal age, socioeconomic class, parity, past history are important risk factors for Preterm birth. If added to the present scoring system they will greatly improve the predictability of the scoring system in Indian context. Similar study was also found by another author in India. [20]

The total perinatal deaths were 104 (49 still birth + 55 neonatal death) giving an incidence of 55.3 %

perinatal mortality. As compared to western studies it is much higher. This is due to the fact that they have lower rate of preterm birth and much better neonatal services including intensive care units for preterm and low birth weight babies. Regarding neonatal death our results are comparable with Khandeparkar el al study. [11]

CONCLUSION

Our data in this study shows the correlation with various risk factors to the preterm birth. From the present study, it is concluded that to make creasy risk score more specific and effective in the Indian context, it should be modified by giving higher score to women with low socioeconomic status, low pregnancy weight, physical work during pregnancy and low maternal age. A slightly modified scoring system needs to be devised for Indian population. More elaborate information about the components of the scoring system is required for understanding the need to devise it in Indian context.

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Conflict of Interest – Nil

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