

Study of high risk scoring in pregnancy and perinatal outcome

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Abstract

Introduction: High risk pregnancy refers to pregnancy with an increased risk of adverse outcome in mother or the baby. Scoring the risk, will identify mothers at risk earlier, so that proper resource allocation, planned management or timely referral to higher centers is facilitated and thereby perinatal mortality or morbidity can be reduced.

Methods: 200 pregnant women with term gestation, admitted to labour room were evaluated. The risk factors in each case were assessed and their individual risk scores were determined using a simple scoring system. Subsequently their perinatal outcomes were compared to their respective risk scores.

Results: It was found that there was a significant association between poor perinatal outcome and high risk pregnancies predicted by this scoring schedule. 20% of the cases belonged to high risk group, out of which 32.5% cases had maternal complications. Significant association between high risk score and perinatal mortality and birth asphyxia was found.

Conclusions: There was a significant correlation between high risk and poor perinatal outcome. So a simple scoring system, such as the one used in our study, can be adopted at primary and rural health centers as a screening tool to predict pregnancies at high risk for poor perinatal outcome. Thereby facilitating early referral of these women to tertiary care centres.

Keywords: High risk pregnancy, Risk score, Perinatal mortality, Birth asphyxia, Low birth weight.

Introduction

A relatively small percentage of high risk obstetric population gives rise to a disproportionately high percentage of perinatal and maternal morbidity and mortality. Scoring the risk factors will be of immense help to detect high risk pregnancies earlier and to optimize their management.⁽¹⁾ In our study we use a simple and easily applicable risk scoring system for detection of high risk pregnancy and to find the correlation between the various degrees of risk and perinatal outcome. Such a scoring schedule will facilitate early detection, proper resource allocation, planned management and timely referral of high risk antenatal women and thereby reduces perinatal morbidity and mortality.

Methods

Study Design: Prospective analytical study

Study Period: January 2016 - June 2016

Study Setting: Department of Obstetrics and Gynaecology, Kamineni Institute of Medical Sciences, Narketpally.

200 Pregnant women with term gestation reporting to the labour room at our institute during the study period between January 2016 to June 2016 were recruited regardless of their booked/ unbooked status, age, parity, socioeconomic status, associated diseases or complications etc. Careful history was elicited, followed by thorough general, systemic, obstetric examination and relevant investigations to determine the risk factors in each case.

The observations were recorded in prenatal scoring form based on scoring system suggested by Dutta and Das⁽²⁾ and individual risk scores were calculated (Table

1). Based on their total scores, the cases were divided into low (0-3), moderate(3-5) and high risk(>=6) groups.

Subsequently the outcome for the mother in terms of (1) Mode of delivery and (2) Complications like postpartum haemorrhage, perineal tears, wound infections, sepsis and mortality were studied.

The perinatal outcome variables studied, for the babies were (1) Birth weight (low birth weight defined as < 2500 gms, including both pre-term and SGA), (2) APGAR score at one and five minutes (3) Birth asphyxia, diagnosed by Apgar < /=3 at one and five minutes after birth and acidemia (umbilical artery Ph <7) and (4) Perinatal mortality (intrauterine deaths, still births and early neonatal deaths upto seven days of life).

These observations were compared with the respective risk scores of the mothers. For statistical evaluation, Chi square test for the analysis of significance was used.

Results

The antenatal women who have been recruited in the study were classified as low risk (0 – 2), moderate risk (3 – 5) and high risk (>= 6) based on the cumulative total of their respective scores. Out of the total 200 cases studied, 48% were graded as low risk, 33% as moderate risk and 20% belonged to high risk(Table 2).

20% of the low risk women and 41.35% of the moderate risk group women were unbooked. The prevalence of unbooked cases among high risk women was as high as 77%. The need for operative intervention increased with increasing risk score of the mother. It

was 82.5% in case of high risk group, where as it was 38.4% and 15.1% in moderate and low risk groups respectively. Perinatal mortality was exclusively found in high risk group. Out of the 4 cases of perinatal deaths in high risk group, one was intra uterine death, two were still births and one was early neonatal death accounting to perinatal mortality rate of 100 per 1000 live births in the high risk group. Perinatal complications were seen only in 11.5% and 15.3% in low and moderate risk groups respectively. The high risk group had 30% incidence of birth asphyxia diagnosed by APGAR scores ≤ 3 at one and five minutes and metabolic acidemia (umbilical artery Ph < 7). Women with risk score ≥ 6 had significantly high risk of perinatal mortality ($p = 0.0003$) and birth asphyxia ($p = 0.0005$) (Table 3). Maternal complications were seen in 32.5% of high risk cases.

Table 1: Dutta and Das Scoring system

Reproductive History factors	Score	Associated disease Factors	Score
Age <16	1	Diabetes Mellitus	3
16-35	0	Cardiac diseases	3
>35	2	Chronic renal disease	2
Parity 0	2	Previous Gyn. Surgery	1
1-4	0	Infective hepatitis	1
5/>5	2	Pulmonary tuberculosis	2
Past Obstetric History		Under nutrition	2
Abortion / Infertility	1	Other diseases (according to severity)	1-3
PPH/Manual Removal	1	Present Pregnancy Factors	
Baby>4kg (4000gms)	1	Bleeding <20 weeks	1 and 3
PIH / Hypertension	1	>20weeks	
Previous caesarean section	2	Anaemia < 10 gm	1
Still birth / neonatal death	3	Hypertension	2
Prolonged labour	1	Hypertension with albuminuria	3
		Multiple Pregnancy/breech	3
		Rh-isommunization	3
		Prolonged pregnancy	1
		Oligohydramnios/ Polyhydramnios	2
		Prom	2
		Small for dates	1

Total Score: High(≥ 6) / Moderate (3-5) / Low risk (0-2)

Table 2: Classification into risk groups n = 200

Risk Group	Score	No. of cases n=200
Low Risk	0 - 2	95
Moderate Risk	3 - 5	65
High Risk	≥ 6	40

Table 3: Comparison of perinatal outcome in risk groups

Risk Group	LBW	PNM	Birth Asphyxia	N= 51
Low Risk	6	-	5	11
Moderate Risk	6	-	10	16
High Risk	8	4	12	24

Table 4: Comparison of incidence of high risk cases

Study	No. of cases	Incidence of high risk pregnancy
Present study	200	20%
Samiya M et al(2005)	400	15%
Seema Thakur et al(1994)	250	9.2%
V Krishnan et al(1986)	777	7.8%

Table 5: Risk of birth asphyxia

Study	Low Risk	Moderate Risk	High Risk
Present study n=200	5.26%	15.3%	30%
Samiya M et al n=400 (2005)	13.6%	20.6%	39.4%
Seema thakur et al n= 250 (1994)	5.50%	18.48%	50.0%

Table 6: Distribution of perinatal mortality in risk groups

Study	Low Risk	Moderate Risk	High Risk
Present study n=200	nil	nil	10%
Samiya M et al n=400 (2005)	2.74%	8.8%	18.2%
Seema Thakur et al n= 250 (1994)	1.83%	2.52%	16.66%

Discussion

High risk pregnancy requires exemplary individualized care and special attention as this group is responsible for maximum perinatal mortality and morbidity even though they form a small proportion of the entire population.

Despite recent advances in maternal and neonatal care in India, perinatal mortality is still high i.e. 49 per 1000 live births compared to 5-10 per 1000 live births in developed countries. 70-80% of the perinatal mortality in developing countries is accounted for by mothers falling under high risk category. This underscores the need for early identification of the high risk mothers so that they receive timely and appropriate care which can modify the perinatal outcome in these patients.

Developing a simple, practical and reliable risk scoring schedule which could help in identification of at risk mothers was the main aim of the present study.

In the background of illiteracy, ignorance, poverty, resourcelessness, lack of quality care, screening high risk pregnancy by using a scoring system is simple, cost-effective non-invasive and easily accessible.

In the present study the incidence of high risk pregnancy was 20% which is comparable to (15%) incidence in a study done by Samiya M, Samina⁽³⁾ M in 2005, and to (12.5%) incidence reported by Sundaraka et al in 2001 (Table 4). The incidence of high risk pregnancy in this study is higher than that observed by Harinderkaur & Seema Thakur⁴ in their study in the year 1994 (9.2%). In the present study 45% belonged to low risk, 33% to the moderate risk and 20% to the high risk category which is comparable to that of 36.5%, 48.5% and 15% respectively seen in study by Samiya M et al.⁽³⁾

In the present study the risk of low birth weight increased from 6.31% in low risk group to 8.11% in moderate risk and 20% in high risk group this is less when compared to 12.3%, 17.64% and 48.8% respectively in study done by Samiya M et al.⁽³⁾ The risk of operative intervention increased with increasing risk score, in the present study 82.5% of the high risk pregnant women had operative intervention either cesarean section or instrumental vaginal delivery. However in the study by V Krishnan et al,⁽¹⁾ operative intervention is seen in 40.4% of the high risk women. In the present study, we observed a significant risk ($p=0.0005$) of birth asphyxia (30%) in the high risk group. This was comparable to that of 13.6%, 20.6% and 39.4% in study by Samiya M et al.⁽³⁾ and 5.05%, 18.48% and 50.0% in study by Seema Thakur et al.⁽⁴⁾ (Table 5). In our study, perinatal mortality was exclusively found in high risk pregnancies (10%), showing a significant association ($p=0.0003$) where as in Samiya M et al study it was distributed as follows, 18.2% in high, 8.8% in moderate and 2.74% in low risk (Table 6) groups. In our study perinatal mortality rate in high risk group was as high as 100 per 1000 live births, in study by Samiya M et al.⁽³⁾ the perinatal mortality increased from 27 per 1000 live births in low risk group to 96 per 1000 in moderate risk and 222 per 1000 in high risk group.

In our study it was also found that majority of the women belonging to high risk category, were of unbooked status, not receiving adequate antenatal care.

Conclusions

There is a significant correlation between high risk and poor perinatal outcome.

The factors included in the scoring system were relevant for determining the risk groups through scoring.

The present study showed that through scoring the risk factors, it is possible to identify the mothers who are expected to contribute to poor pregnancy outcome.

The main objective of the "At risk approach" is optimal use of existing resources for the benefit of majority. Through identification of mothers at risk, minimum care for all could be ensured, while providing guidelines for diversion of limited resources to those who most need them. This kind of approach is very much essential in tertiary care centers like our hospital where not only patients belonging to high risk group but low risk category also seek medical attention.

Despite recent advances in obstetrics and neonatal care in India, our country is still facing high perinatal mortality rate. One of the reasons for this is, failure to identify the pregnancy and foetus at risk "in time"!!

High risk obstetrics units and well equipped advanced neonatal care centres are still not available in rural India. So, there is a need for a simple cost effective screening tool at PHC level to identify high risk pregnancies earlier and facilitate timely referral. This in turn helps to change the perinatal outcome significantly in these women by appropriate management at tertiary care centres.

So in our study we used one such simple scoring system to identify high risk pregnancies and correlate the risk score with perinatal outcome.

We found that there was a significant association with poor perinatal outcome and high risk pregnancies predicted by this scoring schedule. So we recommend that such scoring systems can be incorporated in the antenatal case records at PHC level, second referral units and urban health posts, for early detection and appropriate management of high risk pregnancies.

Further, when this scoring system is applied at early gestational age, certain modifiable risk factors can be identified. They can be treated aptly and thereby the incidence of high risk pregnant women at term gestation can be reduced, which indirectly improves the perinatal outcome.

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