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**Original Research Article**

# Prenatal risk score in high risk pregnancy cases and perinatal outcome: a study from South India

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## ABSTRACT

**Background:** Identification of a high risk pregnancy by Coopland score helps the obstetrician to identify patient at high risk and also elaborate a prognosis of pregnancy. The present study was conducted to evaluate perinatal outcomes in high and low risk pregnancies.
**Methods:** In the present study of 100 cases of high risk caesarean section were evaluated and compared with 100 cases of low risk caesarean sections over a period of two years.
**Results:** 40% and 28% of the high risk and low risk group respectively had low birth weight baby. In the high risk group, 2% had neonatal death, while these figures were 0% in the control group respectively. 28% babies in the study group and 18% babies in the control group had mild to severe depression and Apgar score below 6-4. 42% and 12% babies in the high risk and low risk group respectively had perinatal morbidity which was in the form of prematurity, IUGR, respiratory distress syndrome and birth asphyxia. 7% and 4% cases in both study and control group respectively had poor perinatal outcome.
**Conclusions:** We suggest Coopland risk scoring for every case admitted for a caesarean section, which will be definitely helpful in predicting and evaluating the eventual perinatal outcomes. Appropriate timely care and referral can have a positive impact in lowering the perinatal mortality and morbidity and possibly better maternal outcome.

**Keywords:** Caesarian section, Coopland scoring, High risk pregnancy, Perinatal outcome

## INTRODUCTION

A high-risk pregnancy (HRP) is one in which the maternal environment or past reproductive performance presents a significant risk to fetal well-being, such as premature birth ,small for date infant, full term with low reservoir or still births and early neonatal death. Identification of patients at risk for these complicated pregnancies with poor outcome is fundamental to antenatal care.[1]

A high risk pregnancy may be identified by using a scoring system such as the system developed by Coopland AT.[2] Risk scoring system may be defined as a formalized method of recognizing, documenting and cumulating antepartum, intrapartum and neonatal risk factors in order to predict complications for the fetus and new born.[1]

The perinatal mortality rate has often been used as an index of the level of development in a community. It not only reflects the socioeconomic status, educational level and cultural background of the mother but also comments on the quality of medical care provided to the mother and her neonate. Despite recent advances in modern obstetrics and neonatal care India, is still facing a high (46/1000) perinatal mortality rate. One of the reasons for this dismal performance is failure to identify the foetus at risk in

time. Perinatal outcome can be changed significantly by early detection followed by special intensive care of high risk pregnancies.[3] Hence, this study was undertaken with the objective of evaluation of high risk pregnancy cases in terms of perinatal outcome.

## METHODS

This prospective descriptive study was conducted at Department of Obstetrics and Gynaecology at Mamata General Hospital, Khammam from August 2007 to August 2009. Clinical evaluation of 100 high risk and 100 low risk caesarean cases with perinatal outcome was done. All married women aged from 16 years to 40 years, having gestational age of more than 28 wks and underwent Caeserian section (Emergency/elective) were included in the study. The cases under study included booked and unbooked admission. The booked cases in general had minimum of two antenatal check-ups. On admission history of the patient was taken regarding her age, address and occupation, menstrual history, obstetrical history was taken regarding gravity, parity abortion, number of term & preterm labours, any history of previous CS, indication (Medical, Surgical, Obstetrical and Gynaecological) for CS and intra-operative complication. Scoring of the patients (low risk and high risk cases) was done by modified Coopland's Scoring System.[2] Values of all the high risk factors were summed up and a total score determined whether the pregnancy was "Low risk" or "High risk", accordingly and were categorized as:

Low risk with the score of 0-2

High risk with the score of 3-5

Majority of patient underwent emergency section. The intrapartum scale focused on problems of abnormal progress of labour, meconium stained liquor, fetal heart rate deceleration, presentation, induced labour and mode of delivery. Details about neonatal factors included were birth weight, gestational age, Apgar score, hypothermia, congenital anomalies and some of the important problems like birth asphyxia and respiratory distress. Breast feeding was stated after 4 hours of cesarean section. Detailed history and information including neonatal complication and perinatal outcome was recorded using predesigned and pretested proforma. The observations in both groups were compared using p values calculated P value of <0.5 was taken as statistically significant. Results were compared with similar studies.

## RESULTS

100 high risk (study group) and 100 low risk (control group) caesarean cases with perinatal outcome was done. 40% and 28% of the study and control group respectively had low birth weight baby (Figure 1). In the high risk group, 2% had neonatal death, while these figures were 0% in the control group respectively. 28% babies in the study group and 18% babies in the control group had mild to severe depression and Apgar score below 6-4 (Table 1). 42% and 12% babies in the high risk and low risk group respectively had perinatal morbidity which was in the form of prematurity, IUGR, respiratory distress syndrome and birth asphyxia (Table 2). 7% and 4% cases in both study and control group respectively had poor perinatal outcome (Table 3).

**Table 1: Comparative analysis of perinatal outcome between study group and control groups.**

| Perinatal Outcome | High Risk | | Low Risk | | Z value | P value |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | | |
| Total birth | 100 | 100 | 100 | 100 | | |
| Live birth | 96 | 96 | 100 | 100 | | |
| Still birth<br>FSB<br>MSB | <br>-<br>- | | <br>-<br>- | | | |
| Neonatal death | 2 | 2 | - | - | 1.28 | P>0.05 |
| Perinatal mortality | 2 | 2 | | | | |
| Apgar score 7-10 no depression | 58 | 58 | 82 | 82 | 0.975 | P>0.05 |
| 4-6 mild depression | 26 | 26 | 6 | 6 | | |
| < 4 severe | 14 | 14 | 12 | 12 | | |

**Table 2: Comparative analysis of perinatal morbidity between study group and control groups.**

| Perinatal Morbidity | High Risk | | Low Risk | | Z value | P value |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | | |
| Respiratory distress syndrome | 8 | 8 | 4 | 4 | 0.51 | P>0.05 |
| Birth asphyxia | 4 | 4 | 2 | 2 | 1.09 | P>0.05 |
| Anemia (moderate) | 2 | 2 | - | 0.5 | | |
| Neonatal hyperbilirubinemia | 8 | 8 | - | - | | |
| Prematurity | 12 | 12 | 4 | 4 | 2.75 | P<0.01 |
| IUGR | 2 | 2 | - | - | 0.24 | P>0.05 |
| Septicemia | - | - | - | - | | |
| Meconium aspiration syndrome | 4 | 4 | 2 | 2 | 0.715 | P>0.05 |
| Intracranial hemorrhage | - | - | - | - | | |
| Milk aspiration | - | - | - | - | | |
| Congenital anomalies | - | - | - | - | | |
| Neonatal hypogycemia | 2 | 2 | | | | |
| | 42 | 42 | 12 | 12 | 3.60 | P<0.01 |

## DISCUSSION

Caesarean section (CS) is now safer than it has ever been, in terms of advances in techniques, blood transfusion, surgery and the availability of "powerful" antibiotics.

However, The mortality and morbidity could be much higher in developing countries, where a number of health facilities lack proper equipment, trained personnel, blood bank and clean operation theatres. A concomitant decrease in perinatal mortality has not been substantiated by an increase in the rate of CS in developing countries, although in the western countries a steady drop in perinatal mortality has been shown.[4]

**Table 3: Comparative analysis of neonatal outcome between study group and control groups.**

| Neonatal Outcome | High Risk | | Low Risk | |
|---|---|---|---|---|
| | No. | % | No. | % |
| Term | 94 | 94 | 96 | 96 |
| Prognosis | | | | |
| Good | 26 | 26 | 36 | 36 |
| Average | 8 | 8 | 4 | 4 |
| Poor | 2 | 2 | - | - |
| Stay in nursery | | | | |
| < 1 day | 26 | 26 | 32 | 32 |
| 1-7 days | 6 | 6 | 6 | - |
| > 7 days | 4 | 4 | | - |
| Antibiotics (broad spectrum) | | | | |
| < 5 days | 10 | 10 | 6 | 6 |
| > 5 days | 12 | 12 | 4 | 4 |

**Table 4: Comparative analysis of neonatal outcome according to Coopland's scoring system.**

| Coopland's score | Low risk patients | High risk patients | Neonatal morbidity |
|---|---|---|---|
| 0 | 12 | | 0 |
| 1 | 8 | | 2 |
| 2 | 80 | | 8 |
| 3 | | 76 | 34 |
| 4 | | 18 | 8 |

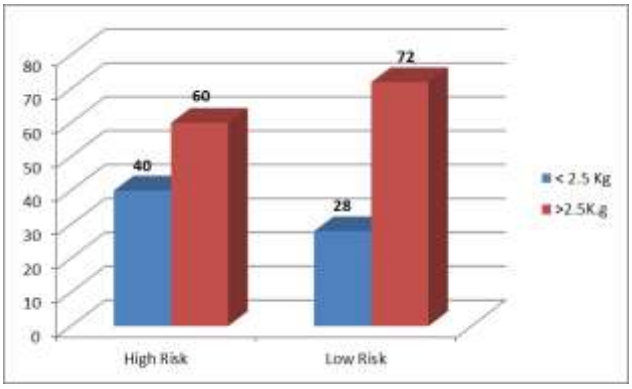


**Figure 1: Comparative analysis of birth weight of babies between study group and control groups.**

Different scoring technique or color coding the risk status could not comprehend accurately prediction of the outcome, where many of the risk factors with different score may overlap with wanted or unwanted outcome.[5]

By using Coopland risk factor scoring we have divided cases into high risk cases and low risk cases.

In our study, it is evident that the maximum numbers of babies were more than 2.5 kg in both the high risk and low risk groups. This is also worth mentioning that the incidence of LBW was more in the study group as compared to the low risk group. Near similar observations were reported by Dutta and Das and Samiya M respectively.[3,6] Low birth weight, which simply signifies that the baby is born malnourished, is a formidable challenge for India which, according to the WHO, tops the world with an incidence of 30%.[3]

In our study, it is seen that the incidence of perinatal morbidity was more in high risk group. This is also evident that in the high risk group prematurity was the most common perinatal morbidity (12%) followed by respiratory distress (8%). While in the low risk group most common cause were prematurity (4%) and RDS (4%), followed by birth asphyxia (2%). Similar were findings of Jain S et al, where low risk group mothers had 50% lower incidence of high risk neonates (41.3%) as compared to high risk group mothers who had 84.4% of high risk neonates.[1]

All the perinatal deaths (4 cases) in the present study were in high risk group, with none in low risk group. This was in line with findings observed by Jain S et al, where perinatal mortality rate was 198.8 and 614.5 in low and high risk groups respectively showing increased perinatal mortality with increased maternal high risk score.[1] However, it was noted that the perinatal death rate of women at low risk intended to deliver in primary care was higher than that of women at high risk delivering in secondary care.[7] It is observed in other study, that the women with one or more risk factors were 17.1 times more likely to lose their baby during the perinatal period than those with no risk.[3] Clear trend was observed in a study in China between higher pregnancy complications and fetal deaths (including stillbirth) and early neonatal death.[8]

Apgar score had better scores in low risk group. 58 cases were observed in with score more than 7, and 14 cases with score less than 4. Similar results were observed by Vijayasree M, wherein better Apgar scores were observed in low risk groups.[9] APGAR score is a good determinant of hypoxic stage of fetus and inspite of good resuscitative measures undertaken in a new born with low APGAR, perinatal outcome hardly improved.[1]

In present study, hospital stay of neonates was for lesser duration in low risk mothers, and lesser number of babies received antibiotics. In a study in China, average length of hospital stay in high risk group was 8.5±6.3 days, and, 99.2% of babies received antibiotics.[8] It was further observed that, this trend should have been more prominent and relevant in the emerging regions, requiring advanced perinatal care system emphasizing on routine

screening services for risk factors associated with adverse pregnancy.[8]

## CONCLUSION

This survey demonstrates pregnancy complications and related perinatal morbidity as risk factors impacting on neonatal outcome. We suggest Coopland risk scoring for every case admitted for a caesarean section, which will be definitely helpful in predicting and evaluating the eventual perinatal outcome. Appropriate timely care and referral can have a positive impact in lowering the perinatal mortality and morbidity and possibly better maternal outcome.

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