

IDENTIFICATION OF HIGH RISK PREGNANCY BY A SCORING SYSTEM AND ITS ASSOCIATION WITH PERINATAL OUTCOME OF MOTHERS ADMITTED IN ANTENATAL WARD.



Nursing

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ABSTRACT

AIMS: This study is aimed to determine the proportion of risk categories in pregnancy (Low, Moderate, High) & to find out the association between the risk categories and perinatal outcome.

METHODS: The study was conducted among 372 antenatal mothers admitted for delivery in antenatal ward & they were categorized in three risk categories (Low, Moderate & High) by using Das & Dutta scoring system & newborns assessed for selected adverse perinatal outcome (Low birth weight, Pre-term baby, Respiratory distress syndrome, Hyperbilirubinemia, Congenital anomaly).

RESULTS: It was seen majority of them had moderate level of risk of pregnancy 46%, 33.9% had low level of risk of pregnancy & 20.1% had high risk of pregnancy. It showed statistically that Pre-term baby, Low-birth weight, Respiratory distress syndrome, Hyperbilirubinemia, Congenital anomaly had significant association with the risk categories at the level of significance $p < 0.05$. In high risk group presence of complications were higher.

CONCLUSION: For high risk mother careful supervision & prenatal check-up is very necessary. In conclusion we can say, to achieve an optimal perinatal outcome, high risk factors must be recognized early.

KEYWORDS

Identification, High risk pregnancy, Scoring system, Perinatal outcome, Antenatal mothers.

1. INTRODUCTION

Pregnancy & childbirth both are natural for every woman's life. During this period the mother has to go through various physiological & psychological changes so as to meet the need of the growing fetus. No matter how healthy the woman is, pregnancy cannot be predictable. According to WHO, over 30% of all pregnancies in South East Asia can be categorized as high risk¹. High risk pregnancies are connected with a higher rate of low birth weight babies and high perinatal mortality and pregnancy related maternal morbidity and mortality. Studies have found that high risk pregnancy presents 80% of maternal mortality².

Perinatal mortality can be reduced by providing proper perinatal services, which can be achieved by finding out the risk factors in pregnancy, and providing standard perinatal and intra-partum care. Early intervention is a key strategy in providing the care for high risk women to enhance better outcome for both mother and baby.

In India about 20-30% pregnancies include in high risk category³. High level of risk pregnancy is accountable for 75% perinatal morbidity and mortality which consists of low birth weight babies; post-natal complications; stillbirths and early neonatal mortality⁴.

Malik et al. described in their study that certain events are occurring during the antenatal & intrapartum period can adversely affect the outcome of the neonate during postnatal life. This emphasizes the significance of developing technique for identifying the high risk pregnancy⁵. Although discovering risk factors among antenatal mothers and providing special care towards them gives healthcare professionals to expect and manage any adverse situation which proceeds a better neonatal outcome. So it's needed to apply simple risk assessment scoring system to find out high risk pregnancy to give more attention when required especially where facilities hardly exist.

There are several scoring systems applied by various authors to correlate risk factors present in mothers and their connection with the neonatal outcomes⁶.

This study was conducted to evaluate how the Dutta and Das scoring system helps to determine the maternal risks to reduce poor perinatal outcome. So the study is taken to identify high level of risk pregnancy and its association with perinatal outcome that will verify the status of

antenatal care services which will help healthcare professionals to strengthen and maintain quality standard of maternal and child health care services. The aim and Objectives of the study were: (1) To determine the proportion of the risk categories (Low, Moderate, & High) by using Dutta & Das scoring system among antenatal mothers in antenatal ward., (2) To study the association between risk categories (Low, Moderate, High) and perinatal outcome and (3) To find out association between selected Clinical and Demographic factors and high risk pregnancy and perinatal outcome.

2. METHODS

Research Design, Samples and Sampling techniques

The research design adopted for the present study was Observational Hospital based Descriptive Study. The sample of the present study included all the women admitted for delivery in antenatal ward, WCH, JIPMER during data collection & 372 women were selected based on the inclusion & exclusion criteria.

Systematic Random Sampling Technique was used for selection of the samples in this study (On each day about 30 antenatal women admitted for delivery, every 3 rd. antenatal women had taken for my study).

Inclusion criteria for the samples were:

- (1) Antenatal mothers who have been admitted for delivery.
- (2) Babies followed up to discharge after birth either in wards or NICU.

Outcome variables:

- The Severity of risk in pregnancy (Low, Moderate & High).
- Selected Perinatal outcome (Preterm baby, Low birth weight, Still birth, Congenital anomaly, Early Neonatal death, Respiratory distress syndrome, Hyperbilirubinemia.)

Description of data collection instrument and study procedure

Data collection was done by using structured observation records (Dutta and Das Scoring System, APGAR Score) and Socio-demographic and clinical variables were collected by record review. In this study High Risk Pregnancy was identified by Dutta and Das Scoring System among the antenatal women admitted for delivery. The observation was recorded in prenatal scoring. Numerical score was given to each characteristic and at the end these added to give total

score to mother and observe cumulative effect of the various factors. Through this scoring system we categorized mothers like- High risk score (≥ 6), Moderate risk score (3-5), Low risk score (0-2). All the patients followed till delivery. Then after delivery fetal outcome were assessed by checking birth weight, APGAR Score was noted at 1 and 5 minutes. They followed up to discharge after delivery for the detection of any complications such as Preterm baby, Respiratory distress syndrome, Hyperbilirubinemia, Low birth weight, Stillbirth, Congenital anomaly, Early Neonatal death.

PART-I

Socio-demographic & Clinical variables

It includes- Religion, Locality, Education, Occupation, Type of family, Monthly Income, Nutrition, Activity, Gravidity, First Antenatal Visit, Previous mode of delivery, Antenatal Visits, Consultation, Height, Weight.

Newborn- Sex of baby, Birth Order, Weight, Maturity, APGAR Score, Type of Delivery.

PART-II

Dutta and Das scoring system⁷ - Numerical score was given to each characteristic and at the end these added to give total score to mother and observe cumulative effect of the various factors. Through this scoring system we categorized the mothers like-

- **High risk score:** (≥ 6)
- **Moderate risk score:** (3-5)
- **Low risk score:** (0-2)

Statistical methods

- Data analysis was carried out by SPSS software.
- Categorical variables: Expressed in frequency and percentage.
- Continuous variables: expressed in terms of mean with standard deviation or median with range based on the distribution of data.
- Association of risk categories with perinatal outcome: Assessed by Chi-square test.
- All the statistical analysis will be carried out at 5% level of significance with p value < 0.05 as statistically significant.

DAS AND DUTTA SCORING SYSTEM⁷

PRESENT PREGNANCY FACTORS		SCORES
BLEEDING <20 WEEKS >20 WEEKS		1 AND 3
ANEMIA <10 GM		1
HYPERTENSION		2
HYPERTENSION WITH ALBUMINURIA		3
MULTIPLE PREGNANCY/ BREECH		3
RH-ISOMMUNIZATION		3
PROLONGED PREGNANCY		1
OLIGOHYDRAMNIOS/ POLYHYDRAMNIOS		2
PROM		2
SMALL FOR DATES		1
PAST OBSTETRIC HISTORY		SCORES
ABORTION / INFERTILITY		1
PPH/ MANUAL REMOVAL		1
BABY >4KG		1
PIH/ HYPERTENSION		1
PREVIOUS CAESAREAN SECTION		2
STILL BIRTH/ NEONATAL DEATH		3
PROLONGED LABOUR		1
REPRODUCTIVE HISTORY FACTORS		SCORES
AGE: <16		1
16-35		0
>35		2
PARITY: 0		2
1-4		0
5/>5		2
ASSOCIATED DISEASE FACTORS		SCORES
DIABETES MELLITUS		3
CARDIAC DISEASES		3
CHRONIC RENAL DISEASE		2
PREVIOUS GYN. SURGERY		1
INFECTIVE HEPATITIS		1
PULMONARY TUBERCULOSIS		2
UNDER NUTRITION		2
OTHER DISEASES (ACCORDING TO SEVERITY)		1-3

TOTAL SCORE: HIGH RISK (≥ 6) / MODERATE RISK (3-5) / LOW RISK (0-2)

3. RESULTS

• Participants

In socio-demographic variables, among 372 antenatal mothers, 211 (56.7%) were full term, 254 (68.3%) antenatal mothers completed secondary education, 306 (82.3%) of them were housewife, 176 (47.3%) had monthly income <Rs.4000, 169 (45.4%) of them had normal BMI & 176 (47.3%) of them had overweight. In clinical variables, 206 (55.4%) were primi, 296 (79.6%) of them came at 3 months for first antenatal visit, 92 (24.7%) of them were undergone through normal vaginal delivery & 49 (13.2%) were undergone through cesarean section in previous mode of delivery where emergency caesarean section was 47 (12.6%) & elective caesarean section were 2 (0.6%), 219 (58.9%) of them had regular antenatal visits. 361 (97%) of them had taken government consultation, 350 (94.1%) of them had more than 145 cm & 366 (98.4%) of them were falling underweight 45-90 kilograms.

In Newborn variables, majority of them 206 (55.4%) were female, 233 (62.6%) of the newborns were first in regards to birth order, 184 (49.5%) of them had 2.5-3 kilograms weight, 337 (90.6%) of them were term, 343 (93.5%) of them had good APGAR score in 1 minute & 370 (99.5%) of them had good APGAR score in 5 minutes, 244 (65.6%) of them had normal vaginal delivery.

In Distribution of Level of risk of pregnancy among antenatal mothers, it was found that among 372 antenatal mothers 171 (46%) of them had moderate level of risk, 126 (33.9%) of them had low level of risk & 75 (20.1%) had high level of risk.

In Distribution of perinatal outcome among the newborns, it was reported that among the perinatal outcomes of antenatal mothers, 23.1% (86) were low birth weight baby, 16.1% (60) of them had respiratory distress syndrome, 7.3 % (27) of them had hyperbilirubinemia, 4.8% (18) of them were pre-term baby & 3.2% (12) of them had congenital anomalies.

Association between risk categories & perinatal outcome

Table -1: Association between risk categories (Low, Moderate, High) of antenatal mothers and perinatal outcome (Pre term baby).

N=372									
SL. NO	RISK CATEGORIES	PERINATAL OUTCOMES PRE TERM BABY				X ²	Df	p-value	
		ABSENT		PRESENT					
		N	%	N	%				
1	RISK CATEGORIES								
	LOW	120	95.2	6	4.8	7.85	2	.016*	
	MODERATE	167	97.7	4	2.3				
	HIGH	67	89.3	8	10.7				

* - Statistical significant at 5% level of significance and ** - Statistical significant at 1% level of significance.

Table- 1 depicted that there is significant association between risk categories & perinatal outcomes (preterm baby) at the level of $p < 0.05$, where majority (10.7%) of perinatal outcome (preterm baby) belongs to high level of risk category.

Table -2: Association between the risk categories (Low, Moderate, High) of antenatal mothers and perinatal outcome (Low birth weight).

							(N=372)	
SL. NO	RISK CATEGORIES	PERINATAL OUTCOMES LOW BIRTH WEIGHT				X ²	df	p-value
		ABSENT		PRESENT				
		N	%	N	%			
1	RISK CATEGORIES							
	LOW	108	85.7	18	14.3	10.3	2	.006*
	MODERATE	128	74.9	43	25.1			
	HIGH	50	66.7	25	33.3			

* - Statistical significant at 5% level of significance and ** - Statistical significant at 1% level of significance.

Table- 2 stated that there is significant association between risk categories & perinatal outcomes (low birth weight) at the level of $p < 0.01$, where majority (33.3%) of perinatal outcome (low birth weight) belongs to high level of risk category.

Table -3: Association between the risk categories (Low, Moderate, High) of antenatal mothers and perinatal outcome (Respiratory distress).

(N=372)

SL. NO	RISK CATEGORIES	PERINATAL OUTCOMES RESPIRATORY DISTRESS				X ²	df	p-value
		ABSENT		PRESENT				
		N	%	N	%			
1	RISK CATEGORIES					7.85	2	.020*
	LOW	113	89.7	13	10.3			
	MODERATE	143	83.6	28	16.4			
	HIGH	56	74.7	19	25.3			

* - Statistical significant at 5% level of significance and ** - Statistical significant at 1% level of significance.

Table- 3 showed that there was significant association at the level of $p < 0.05$ between risk categories & perinatal outcome (respiratory distress syndrome), where majority (25.3%) of perinatal outcome (respiratory distress) belongs to high level of risk category.

Table -4: Association between the risk categories (Low, Moderate, High) of antenatal mothers and perinatal outcome (Congenital anomaly).

(N=372)

SL. NO	RISK CATEGORIES	PERINATAL OUTCOMES CONGENITAL ANOMALY				X ²	df	p-value
		ABSENT		PRESENT				
		N	%	N	%			
1	RISK CATEGORIES							
	LOW	122	96.8	4	3.2	7.93	2	.017*
	MODERATE	169	98.8	2	1.2			
	HIGH	69	92	6	8			

* - Statistical significant at 5% level of significance and ** - Statistical significant at 1% level of significance.

Table- 4 describes that there is significant association between the risk categories & perinatal outcomes (congenital anomaly) at the level of $p < 0.05$, where majority (8%) of perinatal outcome (congenital anomaly) belongs to high level of risk category.

- Association between clinical & demographic factors & high risk pregnancy

Table- 5: Association between the levels of risk among antenatal mothers with their selected demographic variables.

(N=372)

SL. NO	DEMOGRAPHIC VARIABLES	LEVEL OF RISK PREGNANCY						X ²	df	p-value
		LOW		MODERATE		HIGH				
		N	%	N	%	N	%			
1	Gestational Weeks									
	Late Preterm	5	21.7	8	34.8	10	43.5	24.4	8	.002*
	Early Term	27	37	29	39.7	17	23.3			
	Full Term	66	31.3	103	48.8	42	19.9			
	Late Term	25	48.1	26	50	1	1.9			
	Post Term	3	23.	5	38.5	5	38.5			
2	Nutrition									
	Normal BMI	60	35.5	83	49.1	26	15.4	19.1	4	.001**
	Less BMI	0	0	0	0	0	0			
	Overweight	64	36.4	76	43.2	36	20.5			
	Obese	2	7.4	12	44.4	13	48.1			

* - Statistical significant at 5% level of significance and ** - Statistical significant at 1% level of significance.

Table-5 showed that gestational weeks has significant association with level of risk categories at the level of $p < 0.05$ & nutrition has significant association with level of risk categories at the level of $p < 0.01$.

Table -6: Association between the levels of risk among antenatal mothers with their selected clinical variables.

(N=372)

SL. NO	CLINICAL VARIABLES	LEVEL OF RISK PREGNANCY						X ²	df	p-value
		LOW		MODERATE		HIGH				
		N	%	N	%	N	%			
1	Gravidity									
	Primi	68	33	106	51.5	32	15.5	9.53	4	.027*
	Multi	58	35.2	64	38.8	43	26.1			
	Grand-Multi	0	0	1	100	0	0			
2	Previous Mode Of Delivery									
	Normal Vaginal Delivery	45	48.9	32	34.8	15	16.3	30.0	6	<0.001**
	Instrumental Delivery	4	66.7	2	33.3	0	0			
	Caesarean Section	9	18.4	20	40.8	20	40.8			
	Nil	68	30.2	117	52	40	17.8			
3	Reason Of Caesarean Section Delivery									
	Emergency	7	14.8	20	42.6	20	42.6	19.8	4	.001*
	Elective	2	50	1	25	1	25			
	Nil	117	36.4	150	46.7	54	16.9			

* - Statistical significant at 5% level of significance and ** - Statistical significant at 1% level of significance.

Table-6 stated that gravidity has significant association with levels of risk categories at the level of $p < 0.05$ & previous mode of delivery and reason for cesarean section have significant association with levels of risk categories at the level of $p < 0.01$.

- Association between clinical & demographic factors & perinatal outcome

It was reported that activity has significant association at the level of $p < 0.05$ & gestational weeks has significant association at the level of $p < 0.01$ with perinatal outcome (low birth weight). It was also reported that the gestational weeks, educational status and nutrition have significant association with the perinatal outcome (respiratory distress syndrome) at the level of $p < 0.05$.

It was found that type of family has significant association at the level of $p < 0.01$ with the perinatal outcome (congenital anomaly) and nutrition has significant association at the level of $p < 0.05$. The findings also said that the reason for cesarean delivery has significant association with the perinatal outcome (congenital anomaly) at the level of $p < 0.05$.

4. DISCUSSION

It was seen from the study results, among 372 antenatal women, majority of them had moderate level of risk of pregnancy 46%, 33.9% had low level of risk of pregnancy & 20.1% antenatal women had high risk of pregnancy. The level of risk was classified into three categories as low risk (0-2 score), moderate risk (3-5 score) & high risk (>6).

STUDIES	HIGH RISK PREGNANCIES
Kolluru V et al. (2016) ⁸	20% cases
Jain et al. (2014) ⁹	59% cases
Present study	20.1% cases

Bansal et al. (2016) they found that 42% of high risk mothers had babies with prematurity, respiratory distress syndrome, birth asphyxia and 40% of high risk group had low birth weight baby. It was also reported that 8% of the babies had neonatal hyperbilirubinemia who were belonged to high risk group mothers¹⁰.

This study result showed 16% RDS, 7.3% Hyperbilirubinemia & 23.1% LBW baby, 4.8% were pre-term baby.

De et al. (2015) was also found that 6(13.0%) were low birth weight among 46 high risk cases, 5(3.55%) were in low risk cases. Other than this, 1(0.7%) neonatal deaths in low risk group & 3(6.52%) in high risk group¹¹.

As per present study, 33.3% (25) were LBW baby in high risk group.

Jaideep et al. (2017) in their study result determined that incidence of high risk pregnancy was 30.7%. It was also reported that factors such as educational status, age at pregnancy, parity of pregnant women were found to be significantly associated with high risk pregnancy¹².

As per present study, gestational weeks, nutrition, gravidity, previous mode of cesarean section were found to be significantly associated with risk categories.

Inference of the association between selected clinical & demographic factors with perinatal outcome made. It was found that gestational weeks, activity, educational status, nutrition, antenatal visits, consultation, had significant association with selected perinatal outcome at the level of $p < 0.05$.

5. CONCLUSION

Risk assessment is part of regular antenatal care. Risk factors are assessed systematically because it increases overall risk. Women who are at high risk can be recognized during an early antenatal care evaluation. The initial antenatal visit provides a chance to find out the risk factors that can cause complications during pregnancy. Thorough history collection, physical examination & routine investigations are necessary in detecting the risk factors which can show adverse perinatal outcome. So in conclusion we can say, to achieve the good perinatal outcome, high risk factors must be identified early so that appropriate and timely interventions can be implemented. Therefore, high risk approach and management is necessary.

As evidence based practice is the standard criteria for practicing quality nursing care, this study will serve as a basis for other health professionals & students to conduct further studies on advanced management practice of high risk pregnancy to reduce poor perinatal outcome & utilization of scoring system for identification of risks of pregnancies should be emphasized in PHCs also from the first antenatal visits.

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6. REFERENCES

1. De Cherney AH, Pernoll ML. Current obstetric and gynecologic diagnosis and treatment. Norwalk, CT; Appleton and Lange. McGraw-Hill publishing Co. 2007. P- 275.
2. Dutta DC. Textbook of obstetrics. Kolkata. New central book agency(p) Ltd. 2004. P- 631.
3. Gillbert SE. Manual of high risk pregnancy. Missouri. Elsevier publishers. 2011. P- 460.
4. Park K. Textbook of Preventive and Social Medicine. Jabalpur. Banarsidas Bhanot Publisher. 2011. P- 513-24.
5. Malik S, Sinha S. High risk pregnancy. ISSN.2017;1(5):2574-1241.
6. Kushwaha AS. Textbook of Public Health and Community Medicine. New Delhi. Published by Armed Forces medical College in collaboration with WHO India. 2009.p- 810-8.
7. Mufti S, Mufti S. Identification of high risk pregnancy by a scoring system and its correlation with perinatal outcome. Indi J Practi Doc.2008; 5.
8. Kolluru K, Reddy A. Study of high risk scoring in pregnancy and perinatal outcome. Indi J Obstet & Gynecol Resea.2016; 3 (4): 407-9.
9. Jain S, Anand S, Aherwar R. High risk scoring for prediction of pregnancy outcome: a prospective study. Int J Rrprod Contracept Obstet Gynecol 2014;3:516-22.
10. Bansal P, Verma D, Bansal A, Verma A. Prenatal risk score in high risk pregnancy cases & perinatal outcome:a study from South India. Int J Reprod Contracept Obstet Gynecol 2016;5:3889-92.
11. Asis D, Abhijit D, Bikas P, Seshagiri KR, Brijesh S. Neonatal outcome of expectant mothers at risk: a community level study in Nepal. American J Public Healt Resear 2015;3(4A):35-40.
12. Jaideep KC, Prashant D, Girija A. Prevalance of high risk among women attending antenatal clinic in rural field practice area of JNMC, Karnataka, India. Indian J Community Med Public Healt 2017;4:1257-9.