ORIGINAL RESEARCH

Retrospective study to estimate gestosis score in high risk pregnant women and its clinical correlation

¹Priyanka Sachdeva, ²Dr. Manisha Jain, ³Dr. Nishat Ahmed

¹Junior Resident, ²Professor, ³Assistant Professor, Department of Obs and Gyn, PCMS and RC, Bhopal, Madhya Pradesh, India

Corresponding Author

Dr. Manisha Jain

Professor, Department of Obs and Gyn, PCMS and RC, Bhopal, Madhya Pradesh, India

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ABSTRACT

Background- The present study was conducted at tertiary care center to estimate gestosis score in high risk pregnant women and to study its association with fetomaternal outcome. **Methodology-** Retrospective study was conducted on 100 high risk women presented in labour room after 28 weeks of gestation for delivery at Department of Obstetrics and Gynecology during the study period of 6 months. Gestosis risk scorewas evaluated and itsfetomaternal outcome was assessed. **Results-**Mean age of women was 28.3 ± 4.6 years while mean gestational age was 37.6 ± 2.7 weeks. Gestosis score was more than 3 in 32% cases indicating severe risk of pre-eclampsia in these women. Gestosis score of more than 3 was significantly associated with high rate of LSCS and pre-eclampsia (p<0.05). The rate of prematurity, NICU admission and low birth weight was significantly higher in cases with gestosis score above 3 (p<0.05). **Conclusions** -Gestosis score is a useful tool for early identification of women at high risk for developing hypertensive disorders especially in resource limited community settings. The tool can be utilized by even primary health care provider for screening of HDP during the antenatal period.

Keywords- HDP, pre-eclampsia, Gestosis score, FOGSI, fetomaternal outcome

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INTRODUCTION

Though pregnancy is a physiological state during which many physiological changes occur in the body of pregnant female, the pregnancy in some women may be associated with complications leading to maternal and perinatal morbidity and mortality. These pregnancies are termed high risk pregnancies, in which unexpected obstetric or medical conditions of mother may have hazardous effect on the health of mother as well as developing fetus.¹Approximately 30% of the are considered pregnancies as high risk pregnancies.²Hypertensive disorders of pregnancy areamong the most common cause of maternal morbidity and mortality complicating up to 10% of all globally.³The pregnancies the spectrum of hypertensive disorder of pregnancy include gestational hypertension, chronic hypertension, preeclampsia and eclampsia.4

The maternal mortality rate of India according to SRS 2018- 2020 was 97, whereas the MMR of Madhya Pradesh was 173, second largest contributor to National MMR after Assam.⁵Similarly, the neonatal mortality rate of Madhya Pradesh according to NFHS

5 data was much higher in Madhya Pradesh (29 per 1000 live birth)⁶as compared to National NMR (24.9 per 1000 live birth).⁷Identification of high risk pregnancies early during the antenatal period may reduce the maternal and perinatal morbidity and mortality. Antenatal visits during the antenatal period could be utilized to identify and screen high risk pregnant females. Universal screening for hypertensive disorder of pregnancy is recommended but there is no single effective screening test for screening of HDP in general population.⁴Good clinical practice recommendations (2019) has suggested a scoring system called HDP-Gestosis Scorerisk for identification of women at high risk of pre-eclampsia and prioritize action necessary to reduce the morbidity with scanty resources especially in developing countries.⁴It is a simple, easy to use scoring system developed by Mandrupkar G and was further modified by Gupte and colleagues. This scoring system assess the risk based upon clinical features and detailed examination.⁴Each risk factor is given a score ranging from 1 to 3 based upon the severity.⁴

The utility of this scoring system in predicting the risk of HDP is not known. The present study was conducted at tertiary care centre to estimate gestosis score in high risk women and to clinically assess the association of gestosis score with fetomaternal outcome.

METHODOLOGY

This study was conducted as a retrospective study on 100 high riskwomen presenting in labour after 28

weeks of gestation who were admitted for delivery at Department of Obstetrics and Gynecology duringthe study period of 6 months i.e. from 1stJanuary 2022 to 30th June 2022. After obtaining written consent, all the females fulfilling inclusion criteria were enrolled. History pertaining to Gestosis risk score⁴was enquired and score was documented as shown in table 1. Maternal BMI and mean arterial pressure was also documented.

Risk factor	Score	
Age >35 years	1	
Age <19 years	1	
Maternal anemia	1	
Obesity (BMI >30)	1	
Primigravida	1	
Short duration of sperm exposure (cohabitation)	1	
Women born as SGA	1	
Family history of cardiovascular disease	1	
PCOS	1	
Interpregnancy period of >7 years	1	
Conceived with ART (IVF/ ICSI)	1	
MAP >85mmHg	1	
Chronic vascular disease (Dyslipidemia)	1	
Excessive weight gain during pregnancy	1	
Maternal hypothyroidism	2	
Family history of pre-eclampsia	2	
Gestational diabetes	2	
Obesity (BMI>35kg/m ²)	2	
Multifetal pregnancy	2	
Hypertensive disease during previous pregnancy	2	
Pregestational diabetes	3	
Chronic hypertension	3	
Mental disorders	3	
Thrombophilia (Inherited/acquired)	3	
Maternal Chronic kidney disease	3	
Autoimmune disease (RA/ APLAS/ SLE)	3	
Pregnancy with ART (OD or surrogacy)	3	
Based upon the risk score, patients were classified as		
Risk	Score	
Mild	1	
Moderate	2	
Severe	≥3	

Their reason for admission, mode of delivery and feto-maternal outcome was noted.

STATISTICAL ANALYSIS

IBM SPSS software version 20 (IBM Corp. Illinois Chicago) was used for compilation and analysis of data. Inferential and descriptive statistics was done. Association of gestosis score with maternofetal outcome was done using chi square test. P value of less than 0.05 was considered statistically significant.

RESULTS

A total of 100 high risk women with mean age of 28.3 ± 4.6 years were enrolled in our study and mean gestational age was 37.6 ± 2.7 weeks. Out of 100 cases, 66 (66%) women were primigravida and rest 34 (34%) were multigravida.



Out of 100 high risk pregnant females, gestosis score was more than 3 in 32% cases indicating severe risk of pre-eclampsia in these women.

Maternal o	utcome	GESTOSIS SCORE		P value
		<3 (n=68)	≥3 (n=32)	
Mode of	NVD	25 (36.8)	3 (9.4)	0.03
delivery	LSCS	43 (62.3)	29 (90.6)	
Mortality	Present	0 (0)	0 (0)	NA
	Absent	68 (100)	32 (100)	

Table 2- Association of Gestosis score with mode of delivery and maternal mortality

Mortality was observed in none of the patients in our study. We documented that Gestosis score of more than 3 was significantly associated with high rate of LSCS (p<0.05).

Table 3- Association of Gestosis score with Pre-eclampsia

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Pre-eclampsia	GESTOSI	P value		
	<3 (n=68)	≥3 (n=32)		
Present	1 (1.5)	21 (65.6)	0.001	
Absent	67 (98.5)	11 (34.4)		

Overall, pre-eclampsia was noted in 22 cases and eclampsia was noted in 1 case in our study. We documented that Gestosis score of more than 3 was significantly associated with high rate of pre-eclampsia (p<0.05).

Table 4- Association of Gestosis score with Eclampsia

Eclampsia	GESTOS	P value	
	<3 (n=68)	≥3 (n=32)	
Present	0 (0)	1 (3.1)	0.69
Absent	68 (100)	31 (96.9)	

We found no significant association of Gestosis score with eclampsia (p>0.05).

Table 5- Association of Gestosis score with fetal outcome

Fetal outcom	Fetal outcome		GESTOSIS SCORE	
		<3 (n=68)	≥3 (n=32)	
Maturity	Preterm	7 (10.3)	16 (50)	0.001
	Term	61 (89.7)	16 (50)	
NICU admission	Yes	2 (2.9)	8 (25)	0.002
	No	66 (97.1)	24 (75)	
Birth weight	<2.5	6 (8.8)	17 (53.2)	0.001
	>2.5	62 (91.2)	15 (46.9)	
Neonatal mortality	Yes	0 (0)	0 (0)	NA
	No	68 (100)	32 (100)	

Neonatal mortality was noted in none of the case in our study. However, the rate of prematurity, NICU admission and low birth weight was significantly higher in cases with gestosis score above 3 (p<0.05).

Risk fact	ors	Frequency	Percentage
BMI (kg/m ²)	<35	44	44
	>35	56	56
Maternal	Mild	76	76
anemia	Moderate	16	16
	Severe	8	8
GDM	Absent	88	88
	Present	12	12
MAP (mmHg)	<85	78	78
	>85	22	22
Hypothyroidism	Absent	76	76
	Present	24	24

Table 6- Distribution according to various risk factors

Above table represents various risk factors of Gestosis score observed in our study population. BMI was more than 35 kg/m² in 56% and all the cases had anemia, GDM, raised MAP and hypothyroidism was observed in 12%, 22% and 24% cases respectively.

DISCUSSIONS

High risk pregnancy is a pregnancy in which any unanticipated or unexpected obstetric or medical condition associated with the pregnancy may have the potential hazard on the well being of fetus or mother.8 WHO estimates that approximately 30% of the pregnancies are high risk in India and approximately 70 to 80% perinatal or maternal mortalities occur in high risk group.⁹Hypertensive disorders of pregnancy are one of the common cause of maternal and perinatal mortality.³ Though maternal mortality and neonatal mortality is far above the SDG goals, there is a declining trend in NMR and MMR which has been attributed to good antenatal care, during which antepartum and intrapartum risk factors could be identified. Various risk scoring system have been devised to identify high risk pregnancies.^{10,11}

FOGSI- GESTOSIS- ICOG in their good clinical practice recommendations (2019) have suggested the use of HDP Gestosis score for identifying women at high risk of hypertensive disorders of pregnancy.⁴ We thus conducted this study to assess the Gestosis score in high risk women and to document the association of Gestosis score with fetomaternal outcome. This scoring system is a simple, easy to use, and is based on all existing and emerging risk factors. A score of 1 is given for each risk factor and women with the score of 3 or above are considered to be at high risk of preeclampsia.⁴In our study, GESTOSIS score suggested that 28% women were at moderate risk and 32% women were at high risk of pre-eclampsia and HDP. Of them, 22% women had pre-eclampsia and 1 women had eclampsia during delivery. However, Gupta et al documented lower prevalence of pre-eclampsia in their study (15.01%) as compared to our stduy.¹² Similarly, the prevalence of preeclampsia in a study of Mou et al was 14.4%, which was much lower than our finding.13The incidence of HDP documented by Mishra et al in India was also low (15.4%) as compared to our study.¹⁴ The higher prevalence of preeclampsia in our study could be due to inclusion of high risk women.

Gupta et al found gestosis score of 3 or above in 69 (14.59%) cases and of them, preeclampsia was correctly identified in 59 cases.¹² The sensitivity of Gestosis score for identification of HDP was 83.1% at cut off of 3 or above and 94% at cutoff of 2 or above. Lowering the cutoff increased the sensitivity but compromised the specificity.¹²The score is based upon several risk factors associated with higher odds of developing pre-eclampsia based upon underlying mechanism such as depletion of maternal nutrients, arterial stiffening, endothelial dysfunction, placental maladaptation, placental functioning, increased lipid oxidation products, decreased antioxidants, maternal inflammatory response, genetic factors, antipaternal immune response etc.¹⁵⁻²¹

As the Gestosis score was significantly associated with preeclampsia, we observed a significant association of Gestosis score with adverse fetomaternal outcome in terms of LSCS, preterm birth, low birth weight and NICU admissions. Though not with Gestosis score, pre-eclampsia have been associated with adverse maternal outcome and operative intervention in previous studies.²² The adverse fetal outcome in preclampsia have been linked to uteroplacental insufficiency compromising the circulation of fetus.²² Thus Gestosis score may help in identification of women at high risk of developing HDP and predicting the fetomaternal outcome due to underlying hypertensive diseases.

To best of our knowledge, only one study have validated the Gestosis score for detecting HDP in Indian setting.¹² Our findings further added to the preexisting literature and we suggested that HDP Gestosis score may be used as an cost effective tool for identification of high risk pregnant women at risk of developing HDP.

CONCLUSIONS

Gestosis score is a useful tool for early identification of women at high risk for developing hypertensive disorders especially in resource limited community settings. The tool can be utilized by even the nurse of first line health care provider for screening of HDP during the antenatal period.

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