

## FOGSI Gestosis Score as a Predictor of Pre-Eclampsia: An Observational Study

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### Abstract

**Objective:** To evaluate FOGSI Gestosis score as a predictor of pre-eclampsia and to study the various factors affecting it.

**Methods:** 200 Women with preeclampsia, eclampsia attending prenatal clinics and 200 delivering during same period and found to have no preeclampsia, eclampsia were enrolled as control. The patients were provided with the study information sheet and consent form and were explained about the relevant details about the study. All the data were collected with the help of pre structured pre tested proforma. Antenatal and intra-natal details were noted. Maternal and foetal outcome in terms of morbidity and mortality were noted.

**Results:** Comparison of Gestosis Score parameters, it was found that age more than 35 years, Obesity, primigravida, MAP > 85mmHg and Chronic vascular disease (Dyslipidaemia) were significant predictor of preeclampsia with Odds ratio of 3.114, 6.858, 3.24, 256, 7.63 and 3.22 respectively.

It was also found that Multifetal Pregnancy and Hypertensive disorder in previous pregnancy were significant predictor of preeclampsia with Odds ratio of 3.82 and 2.81 respectively. Chronic hypertension, Inherited/Acquired Thrombophilia and Autoimmune disease were significant predictor of preeclampsia with Odds ratio of 8.98, 22.10 and 3.82 respectively.

**Conclusion:** Fogsii gestosis scoring system offers the possibility of segregating high-risk pregnancy to mitigate the adverse effect of preeclampsia. Screening would improve the ability to identify, monitor these women before they develop severe symptom.

**Keywords:** Gestosis Score, primigravida, Chronic vascular disease (Dyslipidaemia) Inherited/Acquired Thrombophilia, Autoimmune disease.

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### Introduction

Preeclampsia continues to be the leading cause of pregnancy complications, accounting for 2-8% of all pregnancies making hypertension during pregnancy the most common medical condition. Preeclampsia, which ranks second to haemorrhage (27%) as a particular direct cause of maternal death, is a major

contributor to maternal and perinatal morbidity and mortality worldwide. They claim 14% of all maternal deaths worldwide, with higher rates in low-income countries. Preeclampsia affects 2.8% of live births in developing countries, which is seven times more than it does in developed ones (0.4%), according to WHO estimates.

Hypertensive disorders complicate 5% to 10% of all pregnancies and form a lethal trio with haemorrhage and infection and have been claimed to cause of 20–30% of maternal mortality globally. Hypertensive disorders are found to be the second leading direct cause of maternal mortality in developing nations, is known to cause 8–14% of maternal mortality in India.

Preeclampsia is hypertensive disorder of pregnancy which develops after 20 weeks of pregnancy, with or without proteinuria and is characterised by vasospasm and vascular endothelial dysfunction. New recommendations issued by the ACOG state that the presence of proteinuria in addition to hypertension is not necessary for the diagnosis of preeclampsia. Preeclampsia is identified by persistently elevated blood pressure >140/90 during pregnancy. It may also be accompanied by other symptoms such as visual disturbances, renal dysfunction, neurological abnormalities, eclampsia, cardiac dysfunction, pulmonary edema, hepatic dysfunction, hematologic dysfunction, and fetal development limitation are some of the clinical characteristics of preeclampsia. It can occasionally appear during the postpartum period as well. Preeclampsia is multifactorial in origin, and it may complicate into multiple life-threatening conditions varying from severe preeclampsia include eclampsia, cerebral haemorrhage, cardiovascular issues, hepatic failure, acute renal failure, pulmonary oedema, ARDS (acute respiratory distress syndrome), DIC, HELLP syndrome, and retinal detachment. Preeclampsia may be associated with Utero-placental insufficiency, which is the primary cause of fetal problems, resulting in small for gestational age (SGA), low birth weight infants (LBW), intrauterine foetal death (IUFD), and complications associated with preterm.

So, the major challenge in modern obstetrics is to early identify –at risk

pregnancy for preeclampsia and timely undertake necessary intervention to reduce maternal and perinatal morbidity and mortality. In countries with resources constraint setting and massive population like ours there should be a simple risk model like FOGSI GESTOSIS SCORE for screening of at-risk pregnancy for preeclampsia. HDP GESTOSIS SCORE is a simple risk model devised by Dr Gorakh Mandrupkar with further modification by committee including —Dr Sanjay Gupte, Dr Suchitra Pandit, Dr Alpesh Gandhi and Dr Girija Wagh. This scoring system is easy, accurate and feasible method and can be easily practised by less skilled worker like ASHA WORKER at ground level. In this scoring system risk score 1, 2 and 3 are allotted to each of the clinical risk factor as per its severity in development of HDP. When the total score is more than or equal to 3, pregnant women should be marked as "AT RISK FOR HDP". So, this scoring should be done at each visit and if score  $\geq 3$  then female should be monitored more vigilantly for sign and symptom of eclampsia.

Despite inception of FOGSI GESTOSIS SCORE, it is still not used and accepted widely, keeping in mind our aims and objective present study was conducted in a tertiary care center to trying to evaluate the hypothesis — FOGSI GESTOSIS SCORE as a predictor of preeclampsia, and also to evaluate the maternal and fetal outcome in relation with gestosis score.

## Materials and Methods

**Study Design:** Observational study

**Study Site:** Department of Obstetrics and Gynaecology, Hamidia Hospital & Gandhi Medical College, Bhopal.

**Study Duration:** 18 month (Jan 2021 to June 2022)

**Study Population:** Women with preeclampsia, eclampsia defined according to ACOG criteria who receive medical services and delivered in the Department of

Obstetrics and Gynecology, Sultania Zanana Hospital & Gandhi Medical College, Bhopal.

**Sample Size:** 200 Women with preeclampsia, eclampsia defined according to ACOG criteria who receive medical services and delivered in our hospital were enrolled as cases into the study and 200 women attending prenatal clinics and delivering during same period and found to have no preeclampsia, eclampsia were enrolled as controlled

**Inclusion Criteria:**

- Antenatal women with preeclampsia, eclampsia as defined by ACOG criteria were taken as cases.
- Antenatal women with normal BP at the time of admission were taken as controls.
- Patients who are willing to give consent.

**Exclusion Criteria:**

- 1) Women not willing to give consent.

**Method of data collection-**

- Permission from the institutional ethics committee and university clearance was obtained, Certificate no: **27136/MC/IEC/2021**
- Meeting and rapport building with the study participants.
- 200 Women with preeclampsia, eclampsia defined according to ACOG criteria who receive medical services and delivered in our hospital were enrolled as cases into the study and 200 women attending prenatal clinics and delivering during same period and found to have no preeclampsia, eclampsia were enrolled as controlled
- The patients were provided with the study information sheet and consent

form and were explained about the relevant details about the study in a language best understood by them.

- Informed written consent was obtained after explaining about the purpose, nature and process of the study and then data collection was started.
- All the data were collected with the help of pre structured pretested proforma.
- The detailed history and through physical and obstetric examination along with relevant investigation were done, risk factors if any were noted.
- The information pertaining to the study like age, parity, gravida, residence, family history was obtained from the patients.
- BMI serum lipid profile thyroid status, pre-gestational and gestational diabetes mellitus, chronic hypertension, mental disease, chronic kidney disease, history of HDP in previous pregnancy, diagnosed autoimmune disease like SLE or APLA syndrome, MAP thrombophilia, PCOS at the first antenatal visit.
- Antenatal and intra-natal details were noted.
- Maternal and foetal monitoring was performed according to standard guidelines.
- Maternal and foetal outcome in terms of morbidity and mortality were noted.

**Outcome variables:**

- Gestosis score as a predictor of preeclampsia.
- Foeto-maternal morbidity and mortality outcomes

**Observation Chart**

**Table 1: Comparison of FOGSI gestosis score with score 1 parameters between cases and controls.**

	Cases N(%)	Controls N(%)	Crude Odds Ratio	95% C.I. for ODDS Ratio	p Value
Age Group (> 35 years of Age)	86(68.8%)	39(31.2%)	3.114	1.98 - 4.87	<b>0.000</b>
Age Group (<19 years of Age)	22(55%)	18 (45%)	1.135	0.65 – 3.21	0.205
Anaemia	96(53.6%)	83(46.4%)	1.30	0.87 - 2.9	0.191
Obesity	71(71%)	29(29%)	3.24	1.99 - 5.29	<b>0.000</b>
Primigravida	87(56.9%)	66(43.1%)	2.56	2.04 - 3.34	<b>0.031</b>
Short Duration of sperm exposure (Cohabitation)	12(60%)	8(40%)	1.53	0.61 - 3.83	0.361
Women born as small. for gestational age	8(66.7%)	4(33.3%)	2.04	0.60 - 6.89	0.250
Family history of cardiovascular disease	13(59.1%)	9(40.9%)	1.47	0.61 to 3.53	0.382
Polycystic ovary syndrome	17(63%)	10(37%)	1.76	0.78- 3.95	0.167
Interpregnancy interval > 7years	5(100%)	0(%)	11.28	0.61 - 205	0.101
Conceived with ART (IVF/ICSI)	9(75%)	3(25%)	3.09	0.82 - 11.09	0.090
MAP > 85 mmHg	186(59.4%)	127 (40.6%)	7.63	4.12 - 14.12	<b>0.000</b>
Chronic vascular disease (Dyslipidaemia)	29 (74.4%)	10 (45.6%)	3.22	1.52 - 6.80	<b>0.002</b>
Excessive weight gain during pregnancy	34(56.7%)	26 (13%)	1.37	0.78 - 2.38	0.263

**Table 2: Comparison of FOGSI gestosis score with score 2 parameters between cases and controls.**

	Cases N (%)	Controls N (%)	Crude Odds Ratio	95% C.I. for ODDS Ratio	p Value
Maternal Hypothyroidism	38(59.4%)	26 (40%)	1.56	0.91 - 2.70	0.103
Family history of preeclampsia	19(65.5%)	10 (34.5%)	1.99	0.90 - 4.40	0.087
Gestational diabetes mellitus	28(60.9%)	18 (39.1%)	1.64	0.87 - 3.08	0.119
Multifetal Pregnancy	11(78.6%)	3 (21.4%)	3.82	1.04 – 13.91	<b>0.040</b>
Hypertensive disorder in previous pregnancy	16 (72.7%)	6 (27.3%)	2.81	1.07 - 7.34	<b>0.034</b>

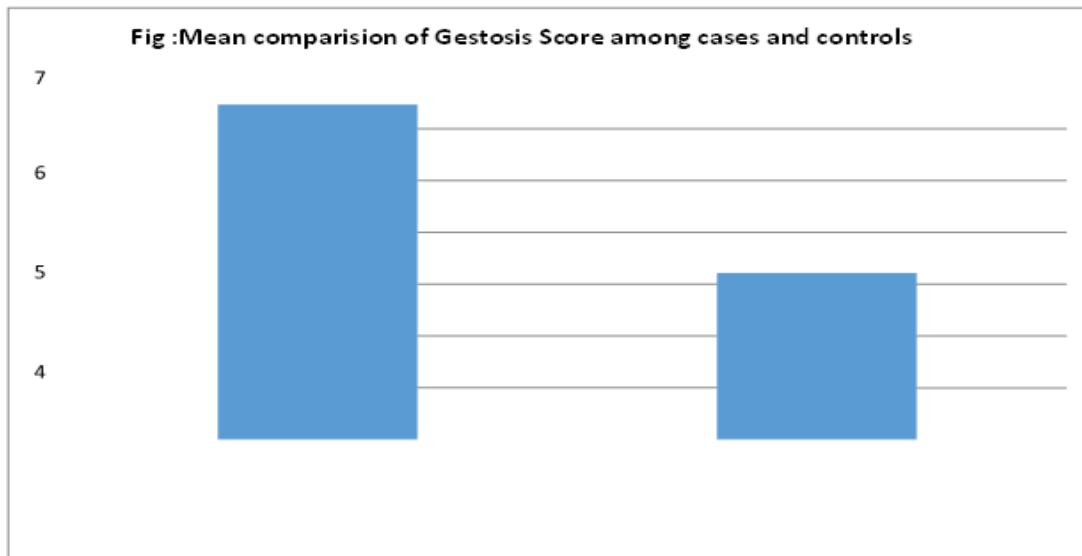
**Table 3: Comparison of FOGSI gestosis score with score 3 parameters between cases and controls.**

	Cases N (%)	Controls N (%)	Crude Odds Ratio	95% C.I. for ODDS Ratio	p Value
Pregestational diabetes mellitus	24(60%)	16(40%)	1.60	0.82 - 3.11	0.161
Chronic hypertension	39(79.5%)	8(20.5%)	8.98	3.10 - 25.98	<b>0.001</b>
Mental disorder	3(60%)	2(40%)	1.49	0.24 - 9.02	0.662
Inherited/Acquired Thrombophilia	10(100%)	0(0%)	22.10	1.28 - 379.8	<b>0.030</b>
Maternal Chronic Kidney Disease	3(60%)	2(40%)	1.507	0.24 - 9.12	0.650
Autoimmune disease SLE/RA/APLA	4 (100%)	0(0%)	9.18	0.49-717.9	0.137
Pregnancy with ART (OD/Surrogacy)	3(50%)	3(50%)	1.000	0.19 - 5.01	1.000
Treatment for Hypertensive disease of pregnancy	9(56.2%)	7(43.8%)	1.29	0.47 - 3.55	0.610

**Table 4: Mean comparison of Gestosis Score among cases and controls.**

	Diagnosis				P Value
	Cases		Controls		
	Mean	Standard Deviation	Mean	Standard Deviation	
Gestosis Score	6.4 7	3.16	3.2 2	3.00	<b>0.00*</b>

Table 4 explains comparison of Gestosis Score among cases and controls. Mean of gestosis score among cases was  $6.47 \pm 3.16$  and among controls was  $3.22 \pm 3$ . The difference between it was statistically significant.



**Results**

Table 1 explains comparison of Gestosis Score parameters between cases and

controls. It was found that age more than 35 years, Obesity, primigravida, MAP > 85mmHg and Chronic vascular disease (Dyslipidaemia) were significant predictor

of preeclampsia with Odds ratio of 3.114, 6.858, 3.24, 256, 7.63 and 3.22 respectively. Rest other factors had no significant association.

Table 2 explains comparison of Gestosis Score parameters between cases and controls. It was found that Multifetal Pregnancy and Hypertensive disorder in previous pregnancy were significant predictor of preeclampsia with Odds ratio of 3.82 and 2.81 respectively. Rest other factors had no significant association.

Table 3 explains comparison of Gestosis Score parameters between cases and controls. It was found that chronic hypertension, Inherited/Acquired Thrombophilia and Autoimmune disease were significant predictor of preeclampsia with Odds ratio of 8.98, 22.10 and 3.82 respectively. Rest other factors had no significant association.

#### Statistical Analysis:

Data was collected and entered simultaneously in statistical package for social sciences (SPSS) version 23 and coded appropriately. The data was analysed keeping in view the aim and objectives of the study. Descriptive statistics were calculated to summarize the sample characteristics in terms of frequency and percentage. Graphs and Charts were made. Analytical and inferential analysis was done. Significant was set at standard 0.05.

#### Discussion

Present study titled Gestosis Score as a Predictor of Pre-Eclampsia: An Observational Study<sup>11</sup> was conducted at Department of Obstetrics and Gynaecology, Hamidia Hospital & Gandhi Medical College, Bhopal. Antenatal female with preeclampsia, eclampsia as cases (defined as per ACOG criteria) and Antenatal female with normal BP at the time of admission as control were included in the study. Keeping in mind aims and objectives statistical analysis was carried out. Salient result of the study is discussed

below.

In present study among 200 cases with high blood pressure, 55% were Preeclampsia without severe Features, followed by Preeclampsia with severe features (32%), Eclampsia (9%) and HELLP Syndrome (4%).

Anaemia-In present study, Presence of anaemia was more common among cases than controls and it shows statistical significance. Majority of the patients among cases had mild to moderate grade of anaemia (46%) and 9.5% had severe anaemia. Agrawal et al in their study also reported that presence of suffering from severe to mild anaemia during pregnancy, women had 1.08-1.32 times risk of preeclampsia in Indian women. Aabidha et al in their study observed that 17 (17.7%) of 97 women with severe anaemia had gestational hypertension or pre-eclampsia and 2 (2.1%) had eclampsia. Micronutrient and antioxidant deficiencies may contribute to pre-eclampsia in women with severe anaemia. According to recent research, pre-eclampsia may develop because of decreased serum levels of calcium, magnesium, and zinc during pregnancy.

BMI-In Present study, Obesity was more common among cases than controls and it shows statistical significance. Majority of the patients among cases falls into obesity class 1 (35%), 24% were overweight and

6% were underweight. Agrawal et al. in their study reported that obese women are at a higher risk of pre-eclampsia. Bej et al. in their study also reported that among cases, 35% had BMI more than 25, also those with BMI more than 25 are 6 times more risk at acquiring preeclampsia. Aabidha et al. in their study reported that majority of the mothers with preeclampsia had BMI between 26-30 (48%), 11% had BMI >31 and 4.4% had BMI < 18. An increased BMI also increases the incidence of induction of labor, caesarean section, pre-term labor and macrosomia. Therefore, we advise pregnant women to attain a

normal BMI of 20–24. Obese individuals often have deranged lipid profile. Dyslipidaemia precedes the clinical manifestation of preeclampsia. Yadav et al. in their study also reported similar findings that pregnant women who had preeclampsia had increased triglycerides, total cholesterol, LDL-C, VLDL-C, and decreased HDL-C concentrations as compared with pregnant women who were normotensive. According to Vani et al. there is statistically significant correlation between normal and PIH cases and levels of TC, HDL, VLDL, and TG.

Mode of delivery-Of all the antenatal women with preeclampsia 34(23%) had spontaneous onset of labour and 114 (77%) required induction of labour. Majority of the cases in present study had vaginal delivery (74%), 26% were delivered by LSCS. Jindal et al in their study reported that among preeclampsia group 58% delivered vaginally and 42% underwent caesarean section. Among eclampsia group also 60% underwent caesarean section. Aabidha et al in their study reported that 58% of the patients were induced and 45% of them needed caesarean section due to obstetric indication. Among those who had spontaneous vaginal delivery, 32.4% were preterm. Among study participants who required induction prior to vaginal delivery, induction due to preeclampsia was done in 90 which resulted in 35% preterm deliveries. Induction due to other obstetric causes were done in 24 patients which resulted in 37% preterm deliveries. Among 52 cases in which LSCS was performed, 17% were performed due to preeclampsia and in 82% other obstetric causes were the indication.

Obstetric history-Women with multigravida stage (had two or more pregnancies) are at high risk of HDP in comparison to women with primigravida (in first pregnancy. In present study, Multigravida and Grand multigravida were more common among cases than controls and it was found statistical significant.

Among cases, 52% were multigravida, 43% were primi and 4% were grand multipara. According to Bej et al majority of the study participants with preeclampsia, majority were > 2 gravida (54%) and gravida more than 2 had odds of 1.23 times in occurrence or preeclampsia. Also, authors reported that women with bad obstetric history are 1.53 times more associated with preeclampsia.

Other risk Associated-Previous history of different disorders: Patients with a previous history and family background related to the complications like diabetes, polycystic ovarian disease (PCOD), renal diseases, autoimmune disorders, obesity, connective tissue disease like lupus erythematosus, rheumatoid arthritis are also at a higher risk of hypertension during pregnancy. In present study among cases 16(72.7%) had Hypertensive disorder in previous pregnancy and 6 (27.3%) in Controls. Hypertensive disorder in previous pregnancy were more common among cases than controls and it was statistically significant. Also, Pregestational diabetes mellitus was present in 24 (60%) among cases and 16 (40%) among controls. Although no statistically significant was found. This is biologically conceivable given that insulin resistance and high insulin levels enhance sympathetic activity and contribute to improper sodium absorption in the tubules, which ultimately induce endothelial cell damage and a higher risk of pre-eclampsia. According to Bej et al cases with PIH, 11.5% and 3% had previous history of hypertension and diabetes mellitus respectively.

Chronic hypertension was present in 31 (83.6%) among cases and 6 (16.2%) among controls. Chronic hypertension was more common among cases than controls and it was statistically significant. Aabidha et al in their study reported that anaemia, diabetes mellitus, previous history of pre-eclampsia and multiple pregnancies were associated with pre-eclampsia. Women who have pre-eclampsia in a first pregnancy have seven times the risk of pre-

eclampsia in a second pregnancy. Elevated risk of preeclampsia has also been found in other specific autoimmune disease. These include rheumatoid arthritis, autoimmune thyroid disease, and type I diabetes. Also, Autoimmune disease was present in 04 (2%) among cases of preeclampsia and none of controls and it was statistically significant. Dong et al in their study reported that Pregnant women with SLE have significantly increased risk of preeclampsia (RR = 2.99) compared with health controls suggesting a pivotal role of SLE in the pathogenesis of preeclampsia.

Simard et al in their study reported that among 742 births to women with SLE and 10 484 births to non-SLE women, there were 32 (4.3%) and 55 respectively. SLE was associated with an increased risk of early-onset preeclampsia (RR 7.8). Women with SLE during pregnancy should be closely monitored for early-onset preeclampsia and future research needs to identify the non-traditional preeclampsia factors that might cause this serious outcome.

Pregnancy with ART-Cases of assisted reproductive technology (ART), mode of delivery in previous pregnancies either normal or C-section also affects HDP. Pregnancy with ART was present in 3 (50%) among cases and 3 (50%) among controls. No statistical significant was found. The mechanism in which ART affects PE is not well known. PE, on the other hand, has been linked to abnormal placentation. Obstetric difficulties might occur as a result of blood flow problems that occur after some ART procedures. Moreover, oxidative stress in the placenta links it to PE. According to Lynch et al, women who received assisted reproductive technologies were two times more likely to develop preeclampsia (odds ratio 2.1 compared with those who conceived spontaneously. Hashiani et al in their Meta-analysis showed a significant increase in preeclampsia in women who conceived by ART compared with those

who conceived spontaneously (RR = 1.71).

Fetal Outcomes-IUFD (6.5%) and Stillborn (4.5%), Low birth weight (21.9%), depressed Apgar (6.2%) ICU admission (20.2%) and Resuscitation (20.2%) were more common among cases than controls Although no statistical significance was found with any of the variable. Lack of routine antenatal checkups, complicated pre-eclampsia cases, and a lack of knowledge regarding the importance of symptoms like decreased foetal movements and late arrival at the hospital all contributed to stillbirths. Jindal et al in their study reported that among preeclampsia and eclampsia group, 34% were low birth weight babies and 33% were extremely low birth weight, also 17.10% small for gestational age (SGA) was seen in preeclampsia and eclampsia group. Aabidha et al in their study reported that among neonates born to mothers with preeclampsia, most common neonatal complication was pre-maturity (23.65%), low birth weight (7.52%) and SGA (9.67%). Also, perinatal mortality constitutes about 15%, which includes intra uterine demise of the fetus (8.6%), still births (2.15%) and neonatal deaths (4.3%).

Gestosis scores-The Organization GESTOSIS has transformed a simple risk model into the HDP GESTOSIS SCORE. It considers every relevant risk factor. The severity of each clinical risk factor's role in the onset of pre-eclampsia is indicated by a score of 1, 2, or 3. A comprehensive history and examination of the woman yield a final score. A pregnant woman is classified as "at risk for pre-eclampsia" and treated accordingly if her overall score is 3 or higher. In present study, Mean of gestosis score among cases was  $6.47 \pm 3.16$  and among controls was  $3.22 \pm 3$ . The difference between it was statistically significant. According to Gupta et al, gestosis score was 2 43.13% of the participants, 1 in 42.28%, and  $\geq 3$  (at risk) in 14.59% of the women.

In present study, on comparison of score 1



parameters of gestosis scores among cases and controls, it was found that It was found that age more than 35 years, age less than 19 years, Obesity, primigravida, MAP > 85mmHg and Chronic vascular disease (Dyslipidaemia) were significant predictor of preeclampsia with Odds ratio of 3.114, 6.858, 3.24, 2.56, 7.63 and 3.22 respectively. According to our research, pregnant women over the age of 35 had a pre-eclampsia risk that was more than three times higher than that of pregnant women between the ages of 20 and 25. This may be due to endothelial dysfunction brought on by the ageing of uterine blood arteries and increased arterial stiffness, which causes a gradual loss of compliance of the cardiovascular vessels. Mishra et al in their study reported that age  $\geq 35$  years, age  $\leq 19$ , maternal anaemia, BMI  $\geq 30$ , primi gravida, short duration of sperm exposure, women born as SGA, history of cardio vascular disease, PCOS, inter-pregnancy period interval > 5 years conceived with ART, MAP  $\geq 80$ mmHg, dyslipidaemia, excessive weight gain during pregnancy have odds of 5.21, 4.01, 1.43, 2.19, 4.54, 1.0, 0.58, 1.88, 1.69, 3.16, 1.0, 22.03, 5.02 and 1.18 respectively in predicting preeclampsia.

In present study, on comparison of score 2 parameters of gestosis scores among cases and controls, it was found that Multifetal Pregnancy and Hypertensive disorder in previous pregnancy were significant predictor of preeclampsia with Odds ratio of 3.82 and 2.81 respectively. Because of the large placental mass and elevated levels of the enzyme soluble fms-like tyrosine kinase-1 (sFlt-1), which can be used as a predictor of the condition due to its high soluble fms like tyrosine kinase-1 to placental growth factor (PlGF) ratios, preeclampsia is thought to be more likely to develop in multi-fetal pregnancies.

Leung et al, revealed that the incidence of preeclampsia in severely obese people increased by 3.97 times, the incidence of preeclampsia in obese people has increased

by 2.1 times in our study. Mishra et al in their study reported that maternal hypothyroidism, family history of preeclampsia, GDM, obesity (BMI>35), multifetal pregnancy and hypertensive disease during previous pregnancy have the odds ratio of 4.82, 3.37, 1.97, 2.13, 5.05 and 1.0 respectively in predicting preeclampsia. Agrawal et al in their study reported that risk of preeclampsia is greater in twin rather than in singleton pregnancies and we found similar result in our study. The reported incidence of pre-eclampsia was 13%-37%, which is 2-3 times higher than singleton pregnancies and about 24.3% in cases of triplets and quadruplicate pregnancies.

In present study, on comparison of score 3 parameters of gestosis scores among cases and controls, it was found that Chronic hypertension, Inherited/Acquired Thrombophilia and Autoimmune disease were significant predictor of preeclampsia with Odds ratio of 8.98, 22.10 and 3.82 respectively. Mishra et al in their study reported that pregestational diabetes mellitus, chronic hypertension, thrombophilia, chronic kidney disease, autoimmune disease like SLE and Rheumatoid Arthritis, pregnancy by ART had crude Odds ratio of 2.07, 7.58, 2.07, 3.06, 4.40 and 1.0 respectively. Catov et al revealed that odds ratio was 4.56 for patients with history of diabetes and 7.48 for patients with the history of chronic hypertension were significant predictor of preeclampsia. Fetal growth restriction complicated 61% of pregnancies, HELLP complicated 49% of pregnancies, early delivery occurred in 71% of pregnancies, severe preeclampsia was associated with protein S deficiency, foetal growth restriction was associated with anti-phospholipid antibodies, and extensive placental infarction was associated with anti-phospholipid antibodies, according to a study by Berks et al.[26]

### Conclusion

This study proves the importance and potential utility of simple tool like FOGSI

GESTOSIS SCORE in predicting preeclampsia. The scoring system offers the possibility of segregating high-risk pregnancy to mitigate the adverse effect of preeclampsia. Screening would improve the ability to identify, monitor these women before they develop severe symptom.

**Limitation** This tool is single center design and has lack of direct correlation with fetomaternal outcome.

#### **Declarations:**

**Funding:** None **Conflicts of interest/Competing interests:** None **Availability of data and material:** Department of Obstetrics and Gynaecology, Hamidia Hospital & Gandhi Medical College, Bhopal. **Code availability:** Not applicable **Consent to participate:** Consent taken **Ethical Consideration:** There are no ethical conflicts related to this study. **Consent for publication:** Consent taken

**What this Study Add to Existing Knowledge** India, a massively populated country which has 22.2% women in child bearing age group and 95.9% of registered pregnancy, still the incidence of preeclampsia in our country is 8-10%. A simple tool like —FOGSI GESTOSIS SCORE may be applied for screening, early diagnosis, prediction and timely referral. This tool is standardized tool made by team of experts and policy makers which give an upper edge to the healthcare worker to identify preeclampsia.

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