Prediction of preeclampsia by gestosis score

Dr Adimulam Vajreswari¹(post graduate ) ,Dr PenumakaRose mary² (Assistant professor), , Dr Paidisirisha (Assistant professor )
Department of Obstetrics and gynaecology ,King George Hospital, visakhapatnam ,Andhra Pradesh

Abstract

Background
HDP-gestosis score is a risk scoring system (score 1–3) for the development of pre-eclampsia. When a pregnant woman’s total score is equal to or greater than 3, she is labelled as “at risk for pre-eclampsia” and is managed accordingly.

Objectives
To determine relation ship between HDP gestosis score and preeclampsia

Methods
This prospective study included 50 pregnant women who presented at the department of Obstetrics and Gynaecology, from June 2020 to December 2021. At first antenatal the patients were assessed for the development of pre-eclampsia. Details of age, gravida, obstetric history, menstrual cycle regularity, polycystic ovarian disease history, duration of marriage, parity, past medical and surgical intervention, previous/present medication, and family history were taken. Gestosis score was calculated and classified into mild (score of 1), moderate (score of 2)and high risk (score of ≥3) for the development of Pre-eclampsia (PE)

Results
50 patients were included in the study
34 patients got score above 3 in that 8 patients not developed preeclampsia 26 patients developed preeclampsia 16 patients got score less than 3 in which 14 patients didnot developed preeclampsia 2 patients developed preeclampsia

Conclusion
Gestosis score is a novel early marker for prediction of the development of PE allowing for a prompt management for the patients, thereby curbing the adverse consequences.

Date of Submission: 14-02-2023
Date of Acceptance: 28-02-2023

I. Introduction

Pre-eclampsia (PE) is one of the commonest complications of pregnancy, affecting 4.6% pregnancies worldwide [1] and 1.8–16.7% pregnancies in the developing countries [2]. It is identified by systolic blood pressure (SBP) and diastolic blood pressure (DBP) greater than 140 mm Hg and 90 mm Hg, respectively, after 20 completed weeks of pregnancy. As reported in an Indian study, the overall pooled prevalence of PE in India was 11% [3].

PE is the major cause of maternal (that include abruptio placenta, disseminated intravascular coagulation, pulmonary oedema, acute renal failure, heart rhythm disturbances, and effects on other organs like liver, brain and lungs) as well as perinatal (fetal growth retardation, preterm deliveries and fetal deaths) complications worldwide [4].

The grave nature of the condition continues to baffle us to use certain predictive markers in the early part of the pregnancy which may help us to identify the women who may develop PE—so that appropriate preventive measures are begun for the prevention and management.

A plethora of maternal risk factors have been established to be positively linked with the development of PE, which include higher age, parity, comorbidities, family history, previous personal history, ethnicity, investigative markers like thyroid profile, uterine artery Doppler velocimetry, PAPP-A levels, placental IGF levels and certain systemic conditions [5, 6]. As these factors are described by individual researchers, taking all of them into account and devising a scoring system for PE prediction were the need of the hour, especially for countries with limited resources and lack of biomarker testing facility.

A simple risk model named HDP-gestosis score has been devised by Dr GorakhMandrupkar with further modifications by committee including “Dr. Sanjay Gupta, Dr.SuchitraPandit, Dr.Alpesh Gandhi and Dr.GirijaWagh” for effective screening and prediction of Pre-eclampsia [7]. This score considers all of the pregnant woman’s present and emerging risk factors. Each clinical risk factor is given a score of 1, 2, or 3 based on its severity in the development of pre-eclampsia. A total score is obtained from detailed history and
examination of the woman. When a pregnant woman’s total score is equal to or greater than 3, she is labelled as “at risk for pre-eclampsia” and is managed accordingly [7].

Till date, to our knowledge, no study has been conducted in the practical setting to determine the diagnostic accuracy and sensitivity of prediction of Pre-eclampsia for HDP-gestosis score. So this study was conducted wherein HDP-gestosis score was applied and the pregnant women were followed-up to confirm and note the predictive ability for the development of PE.

Objectives
To determine relationship between HDP gestosis score and preeclampsia

Methods
A prospective study was done wherein 100 patients who presented in the department of Obstetrics and Gynaecology, kingjorgehospital, visakhapatnam, over a duration of 18 months from June 2020 to December 2021, were enrolled.

The inclusion criteria were: Age more than 18 years, and booked cases
Exclusion criteria are Pregnant patients with COVID-19 disease, malignancy, liver diseases, intake of alcohol, substance abuse and smoking
where individual parameters used in the gestosis score were analysed for the relative risk in increasing preeclampsia. It was noted that mean arterial pressure (MAP) > 85, Dyslipidemia, assisted reproductive techniques, maternal chronic kidney disease, mental disorders (schizophrenia), pregestational diabetes mellitus, hypertension during previous pregnancy, multiple pregnancy, obesity, Gdm, excessive weight gain, chronic vascular disease, Hypothyroidism, family history of HDP, Chronic hypertension, Thrombophilia, autoimmune disease were significant risk factors of Pre-eclampsia.

A detailed demographic history about age, gravida, obstetric history, menstrual cycle regularity, polycystic ovarian disease history, duration of marriage, parity, past medical and surgical intervention and previous/present medication were taken, followed by a routine clinical obstetric examination as per hospital protocol. Weight and height was measured based on which body mass index was calculated. Venous blood sample (5 ml) was collected in the antenatal visit (at 11–18 weeks of gestation) for assessing complete blood counts, thyroid profile, blood sugar levels, blood grouping and autoantibodies which included anti-TPO, antinuclear antibody (ANA), Rheumatoid factor, anti-dsDNA, SS-A and SS-B antibodies for specific diagnosis of the autoimmune disorders.

Taking all these factors into account, gestosis score was calculated by using the app (https://m.apkpure.com/hdp-gestosis-score/hdp.gestosis.score) [9] and classified into mild (score of 1), moderate (score of 2) and high risk (score of equal to or more than 3) for the development of PE.
All the parameters mentioned in the gestosis score were assessed from the history and investigations, and a total score was entered in the master chart for every patient. The various parameters and HDP-Gestosis score are shown in the following table.

The standards and criteria used in the study for classifying the diseases of the patients were [10–19].

**Hypertensive Disease of Pregnancy**

Hypertensive disorders during pregnancy (HDP) include 4 categories: “(1) pre-eclampsia/eclampsia; (2) gestational hypertension (GH); (3) chronic hypertension; and (4) pre-eclampsia/eclampsia variants superimposed on chronic hypertension”.

**Pre-eclampsia**

Pre-eclampsia was defined as de novo blood pressure (BP) elevations (Systolic blood pressure of 140 mm Hg or more or diastolic blood pressure of 90 mm Hg or more on two occasions at least four hours apart) after 20 weeks of gestation coupled with proteinuria (300 mg or more per 24 h urine collection or Protein/creatinine ratio of 0.3 mg/dL or more or Dipstick reading of 2+). Eclampsia is defined as PE with seizures.

**Gestational Hypertension**

De-novo hypertension that develops at > 20 weeks in absence of features of Pre-eclampsia.

**Chronic Hypertension**

Elevated BP before 20 weeks of gestation or persisting beyond 12 weeks postpartum.
Chronic Hypertension with Superimposed Pre-eclampsia
Increased BP and new-onset proteinuria or other end-organ dysfunction in addition to preexisting hypertension.

Thyroid Profile
A laboratory normal range of 0.1–3 mIU/L for TSH, 0.9–1.7 ng/dL for fT4 and 0–35 IU/mL for anti-TPO was used to classify thyroid disease. An increase in the TSH levels or fall in the fT4 levels with presence of symptoms was classified as hypothyroidism, and a fall in the TSH levels or rise in the fT4 levels with presence of symptoms (such as fatigue, weight gain/loss, reduced exercise capacity, constipation hair loss, dry skin, and bradycardia/tachycardia) was classified as hyperthyroidism.

PCOS
The guidelines from the Endocrine Society using the Rotterdam criteria for diagnosis were applied which mandate the presence of two of the following three findings—hyperandrogenism, ovulatory dysfunction, and polycystic ovaries.

MAP
\[ \text{MAP} = \text{DBP} + 0.33 \times \text{PP} \] where PP is the pulse pressure, SBP is systolic blood pressure and DBP is diastolic blood pressure.

Gestational Diabetes Mellitus (GDM)
The diagnosis of GDM was confirmed in the presence of “at least one abnormal value (≥ 92, 180 and 153 mg/dl for fasting, 1-h and 2-h plasma glucose concentration respectively), following 75-g oral glucose tolerance test (OGTT)”.

Excessive Weight Gain During Pregnancy
A weight gain during the 2nd and 3rd trimester (in kgs) > 18 (among women with BMI < 18.5 kg/m2), > 16 (among women with BMI 18.5–24.9 kg/m2), > 11.5 (among women with BMI 25–29.9 kg/m2) and > 9 (among women with BMI > = 30 kg/m2) was considered excess weight gain.

UCTD, RA, SLE, anti-phospholipid syndrome (APS), Sjögren’s syndrome, systemic sclerosis, polymyositis/dermatomyositis and mixed connective tissue disease.

Thrombophilia was diagnosed if there was idiopathic or recurrent venous thromboembolism; a first episode of venous thromboembolism at a “young” age (e.g., < 40 years); a family history of venous thromboembolism; venous thrombosis in an unusual vascular territory; and neonatal purpura fulminans or warfarin-induced skin necrosis.

SLE/APLA/RA/thrombophilia
The American College of Rheumatology has 11 classification criteria for lupus. If a patient meets at least four criteria, lupus can be diagnosed. The criteria include malar or discoid rash; photosensitivity; oral ulcers; arthritis; serositis; abnormal antinuclear antibody (ANA) titers; and renal, neurologic, hematologic, or immunologic disorders.

The participants were tested for the presence of circulating autoantibodies, including ANA. The ANA test was considered positive at a titer ≥ 1:80. Rheumatic diseases were classified according to widely used criteria for undifferentiated connective tissue disease (UCTD), RA, SLE, anti-phospholipid syndrome (APS), Sjögren’s syndrome, systemic sclerosis, polymyositis/dermatomyositis and mixed connective tissue disease.

Thrombophilia was diagnosed if there was idiopathic or recurrent venous thromboembolism; a first episode of venous thromboembolism at a “young” age (e.g., < 40 years); a family history of venous thromboembolism; venous thrombosis in an unusual vascular territory; and neonatal purpura fulminans or warfarin-induced skin necrosis.

Management of PE
The treatment for PE was started if BP remained higher than 140–90 mm Hg. It comprised of labetalol as a first-line therapy at dose of 100 mg BD up to maximum dose of 2400 mg. Nifedipine (preferably extended release) at dose of 10–30 mg OD was prescribed as a second line drug [20]

Results
50 patients were included in the study
34 patients got score above 3 in that 8 patients not developed preeclampsia 26 patients developed preeclampsia
16 patients got score less than 3 in which 14 patients did not developed preeclampsia 2 patients developed preeclampsia
II. Conclusion

Gestosis score is a novel early marker for prediction of the development of PE allowing for a prompt management for the patients, thereby curbing the adverse consequences.

References


[6]. Poon LC, Nicolaides KH. Early prediction of preeclampsia. ObstetrGynecolInt 2014;Article ID 297397. [PMC free article] [PubMed]


[15]. International association of diabetes and pregnancy study groups recommendations on the diagnosis and classification of hyperglycemia in pregnancy. Diabetes Care 2010;33:676–82. [PMC free article] [PubMed]
Prediction of preeclampsia by gestosis score

[16]. IOM. Weight gain during pregnancy: reexamining the guidelines. Institute of Medicine (US) and national research council (US) and committee to reexamine iom pregnancy weight guidelines; 2009.


[33]. Tesfa E, Nibert E, Musahua A. Maternal lipid profile and risk of pre-eclampsia in African pregnant women: a systematic review and meta-analysis. PLOS ONE. 2020;15(12):e0243538. doi: 10.1371/journal.pone.0243538. [PMC free article] [PubMed] [CrossRef] [Google Scholar]


DOI: 10.9790/0853-2202172732 www.iiosjournal.org 32 | Page