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WAIST TO HIP RATIO AS A PREDICTOR OF OBESITY-RELATED PREGNANCY OUTCOMES COMPARED TO BMI

Obstetrics & Gynaecology

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ABSTRACT

Background: The aim of this study is to evaluate the diagnostic properties of waist circumference in the prediction of obesity-related gestational outcomes. Central obesity, which can be measured using various anthropometric parameters, such as waist and hip circumferences, and waist-hip ratio (WHR). The prevalence of pre-existing diabetes and gestational diabetes among women of childbearing age is increasing throughout the world, particularly in South East Asia. This rise in GDM and type 2 diabetes parallels the increasing incidence of obesity among women. Hyperglycaemia in pregnancy is a medical condition resulting from either pre-existing diabetes or insulin resistance developing during pregnancy. Foetal and neonatal morbidity and mortality associated with diabetes in pregnancy can be prevented by meticulous prenatal and intrapartum care Effects on pregnancy: medical complications like hypertension, both essential and pregnancy induced are increased and so also gestational diabetes, foetal macrosomia, increased risk of miscarriage, foetal malformations especially neural tube defects, post maturity is also common and others include IUD and stillbirths Effects on labour : there is increased incidence of abnormal uterine contraction and prolonged labour, shoulder dystocia and there is increased chance of puerperal urinary tract infection, PPH, poor wound healing and lactation failure. **Methods:** 1200 patient were included in the study observation of maternal and foetal complication in the pregnant women with increased waist hip ratio during the first 12 weeks of pregnancy. **Results:** The findings of Preeclampsia vs WHR and gestational hypertension vs WHR were 11% and 13% in the present study. **Conclusion:** Pregnant women who are multiparous or nulliparous must be constantly monitored for any changes in blood pressure as well as preeclampsia symptoms.

KEYWORDS

Preeclampsia, WHR- Waist-hip ratio, BMI- Body mass Index, LGA- Large for gestational age, LDL- Low density lipoprotein, NICU- Neonatal Intensive care unit.

INTRODUCTION

Nowadays, obesity is regarded as having pandemic proportions. Obesity has been linked to higher rates of maternal and neonatal morbidity during pregnancy, including a higher chance of large for gestational age (LGA) babies. Compared to normal weight foetuses, LGA foetuses are more likely to suffer from shoulder dystocia, stillbirth, and transfer to the new born critical care unit. [1] LGA has been connected to an increase in maternal body mass index (BMI) in a number of earlier studies. Pre-pregnancy weight was found to be the most reliable modifiable predictor of LGA in a study of singleton deliveries. Since other research have linked LGA to parity, gender, race, glucose intolerance, diabetes, and maternal weight gain, the results are extremely multivariate. [2]

BMI is a measure of body fatness that is used to forecast the occurrence of illnesses linked to obesity and to test for obesity. Age, colour, gender, and athletic ability all affect the relationship between BMI and body fatness; it is unable to distinguish between fatness as central or visceral. [3] In contrast, the waist to hip ratio (WHR) has been demonstrated to be a more accurate indicator of central adiposity and visceral fat as well as a better predictor of obesity-related conditions like myocardial infarction, stroke, and cardiovascular death when used as a screening tool than BMI. [4,5,6]

The anthropometric measure has not been extensively researched in connection with pregnancy outcomes; nonetheless, in a prospective pregnancy cohort, elevated WHR and BMI were linked to a higher risk of preeclampsia. Infants with central obesity and LGA are were linked to increased levels of insulin, fasting glucose, LDL cholesterol, free fatty acids, and triglycerides, suggesting that the distribution of fat may have a different effect on foetal growth than the amount of fat. [7,8,9]

Moreover, central adiposity is also linked to changes in the levels of particular sex hormones, which could influence how the mother controls the growth of the foetus. [10] The WHR remains mostly unchanged until 20 weeks of pregnancy. An accurate measure of central adiposity would be taken early in pregnancy. [11,12,13]

MATERIALS AND METHODS

A total of 1200 cases were taken up for the study in Bharaath Medical College and Hospital in from January 2022- 31st Oct 2025. Based on the WHR VS Preeclampsia analysis, 200 patients had Preeclampsia. The p-value was found to be <0.0213. Among the WHR VS HTN analysis patients, 230 had HTN, the p-value found to be <0.001. Chances of macrosomia was observed. 200 patient had macrosomia, the p-value was found to be <0.0101. WHR VS Preterm analysis showed 0.064 p-value. Congenital abnormalities and intrauterine foetal death were among the exclusion criteria. Based on the age group, 43% was <25, 14% was > 30 and 43% was 25-30 of age group.

RESULTS AND DISCUSSION

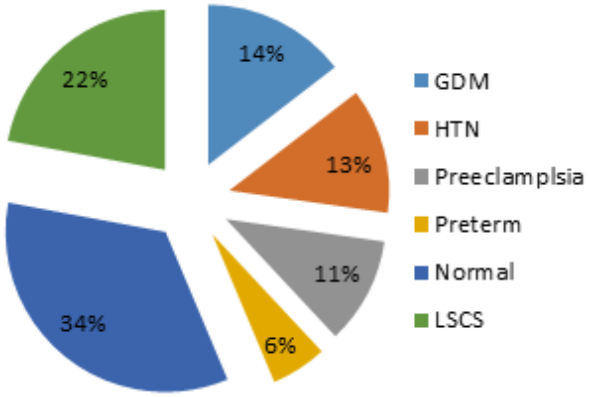

Figure 1: Distribution Of The Variables

As per our literature search, our study is the first report to look into the relationships between maternal WHR and BMI during the first 12 weeks of pregnancy in Chennai. [14] At gestational week 12, we noticed that women with preeclampsia had higher BMIs and WHRs than those without the condition. [15]

Preeclampsia vs WHR and gestational hypertension vs WHR had respective incidences of 11% and 13% in the current study. According to reports, our study's incidence of preeclampsia was similar to the global estimate. [16] US, Iran, and Norway. Around the world, preeclampsia affects 2–12% of pregnancies. Preeclampsia appears to be influenced by a number of factors, including age, socioeconomic status, number of prior pregnancies, and racial differences. [17,18]

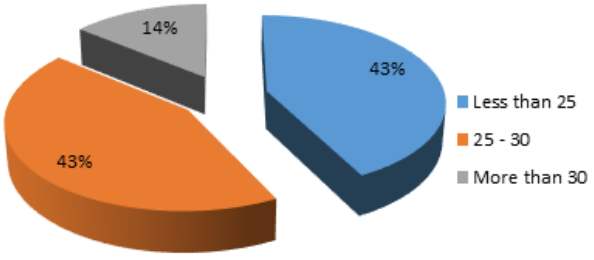

Figure 2: Age Wise Distribution

Previous research has examined the likely impacts of maternal age on preeclampsia. According to some research, preeclampsia and other unfavourable obstetric problems have been rising in tandem with the ages of expectant mothers.[19] Lamminpaa R et al., compared to younger moms, women over 35 had a 1.5-fold increased risk of developing preeclampsia. Wang et al found no correlation between preeclampsia and women's ages in a retrospective analysis of 6619 singleton pregnancies. Age by itself was not a risk factor, but the authors hypothesized that conditions like diabetes or hypertension might affect how pregnancies turned out. [20]

There was a 25% correlation between preeclampsia and maternal age that we could identify. Furthermore, there was no difference in the prevalence of preeclampsia between pregnant women who were nulliparous and those who were multiparous. Nonetheless, a number of earlier investigations have documented increased rates of preeclampsia and unfavourable obstetric outcomes in pregnant nulliparous women. [21] According to a comprehensive analysis of controlled cohort studies, nulliparous women had a higher risk of preeclampsia. The subjects' characteristics may account for these discrepancies. Additionally, there may have been a negligible correlation between maternal age and preeclampsia because the mean age of the moms who became pregnant for the first time was 24.04±4.32 years.

Additionally, women having a history of preeclampsia were excluded from the study based on its inclusion criteria. In the present study 11% had preeclampsia. It is necessary to closely monitor pregnant women who are nulliparous or multiparous for any changes in blood pressure as well as for signs and symptoms of preeclampsia, as several studies have confirmed that parity did not have significant associations with either hypertension or preeclampsia [22].

One risk factor for preeclampsia has been identified as obesity, which is on the rise. [23] Vasoconstriction and endothelial dysfunction have been linked to obesity's increased insulin resistance. Insulin resistance also raises the risk of cardiovascular disease and high blood pressure. Elevated plasma lipids, insulin resistance, and hypertension can all be aggrevated by central fat deposition. [24]

A number of indices, including BMI and WHR, are used to determine obesity. Preeclampsia and hypertension issues have been found to be closely associated with body mass index (BMI), an established anthropometric measure of overall obesity. Other recognized measures of obesity, such as WC or WHR, may more accurately represent abdominal adiposity and be more accurate indicators of diabetes, hypertension, and cardiovascular disease than BMI. WHR is superior to BMI in a few ways[24]

A reliable indicator of central fat distribution is WC. Women can easily self-measure this index, and it is also easier to measure. Like BMI, WHR is not affected by other variables like height or muscle mass. Among various indicators of obesity, some experts think WHR is the most accurate predictor. [25]

We discovered that preeclampsia may be predicted by maternal WHR and BMI. WHR and BMI had respective relative risks WHR at p12 weeks of gestation appears to be a reliable indicator of preeclampsia. This index has gotten little attention during pregnancy, while being routinely used in non-pregnant women to evaluate obesity and associated health hazards. Additionally, Yamamoto et al. discovered a correlation between the risk of preeclampsia and both WHR and BMI in the early stages of pregnancy. [26]

The prospective aspect of the current study was one of its strengths since it enabled us to freely gather all the data required for the investigation and examine causal correlations in this cohort study. In contrast to other studies that typically examined these indices after the first trimester, the anthropometric indices were measured prior to pregnancy weight growth. According to the findings, pregnant women's general health was significantly impacted by their acceptable maternal BMI and WHR, which may also lead to improved obstetric care.

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