ORIGINAL RESEARCH PAPER

Obstetrics & Gynecology

EVALUATION OF PREGNANCY OUTCOME IN RELATION TO FIRST TRIMESTER BODY MASS INDEX.

KEY WORDS: BMI, PIH, IUGR, Gestational Diabetes.

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ABSTRACT

BACKGROUND: The increasing incidence of obesity among women worldwide has become one of the most significant public health concerns. Early pregnancy BMI plays an important role in pregnancy outcome. Women with low BMI or high BMI both have an adverse pregnancy outcome

METHODS: This was a prospective observational study conducted in Department of Obstetrics and Gynaecology Narayana medical college, Nellore, Andhra Pradesh from January 2019 to August 2020. Patients with singleton pregnancy booked in first trimester were included while women with multiple pregnancy, pre-existing medical conditions were excluded from the study. Proper history taking and examination was done, and patients divided into five groups as per guidelines of WHO and National Institute of Health Guidelines. Patients were followed up during entire antenatal period. Any maternal and fetal complications were recorded.

RESULTS: Incidence of anaemia and intrauterine growth restriction (IUGR) was seen more in underweight patients. Postpartum haemorrhage (PIH), gestational diabetes and macrosomia was associated more with patients who were overweight or obese. There was significantly more incidence of lower (uterine) segment caesarean section (LSCS), instrumental delivery, wound sepsis and PPH in patients with higher BMI. Small for gestational age (SGA) babies were seen more in patients with low BMI while large for gestational age (LGA) babies were seen more in patients with high BMI. More neonatal intensive care unit (NICU) admissions were seen in patients with low or high BMI.

CONCLUSIONS: Complications in pregnancy in antenatal period, during labour, postnatal period and adverse neonatal outcome was seen significantly more in patients on either side of BMI (underweight and obese).

INTRODUCTION:

The increasing incidence of obesity among women worldwide has become one of the most significant public health concerns [1]. Early pregnancy BMI plays an important role in pregnancy outcome. Women with low BMI or high BMI both have an adverse pregnancy outcome [2].

High maternal body mass index (BMI) is related to adverse maternal pregnancy outcomes such as pregnancy induced hypertension (PIH), eclampsia, pre- and post-term delivery, induction of labour, macrosomia, caesarean section, and postpartum haemorrhage [3]. Women with lower BMI are at increased risk of preterm deliveries, low birth weight, anaemia and prematurity [4].

So maternal BMI and maternal nutrition needs to be given adequate importance in pregnancy and should be a routine part of antenatal assessment to ensure good maternal and neonatal outcome. ACOG recommends calculation of BMI for all pregnant women at their first visit [5]. This study was thus conducted with the aim to assess maternal and fetal outcome in patients with high as well as low BMI to ensure more careful monitoring in such patients to ensure good maternal and fetal outcome.

METHODS

This was a prospective observational study conducted in Department of Obstetrics and Gynaecology of Narayana medical college, Nellore, Andhra Pradesh from January 2019 to August 2020.

Inclusion criteria considered were patients who booked in first trimester of pregnancy with singleton pregnancy. Women with multiple pregnancy, pre-existing medical conditions like diabetes, chronic hypertension, heart disease, hypothyroidism, were excluded from the study.

Patients who satisfied these criteria were included in the study and proper history taking and examination was done. Patients were divided into 4 groups as per guidelines of WHO and national institute of Health Guidelines (Table 1). Patients were followed up carefully during entire antenatal period. Record of weight gain was done. Any antenatal, postnatal and maternal and fetal complications were recorded.

Table 1: Categorization of patients on basis of BMI.

Group	BMI
Group 1 (Underweight)	Less than or equal to 19.9 kg/m^2
Group 2 (Normal)	20 – 24.9 kg/m^2
Group 3 (Overweight)	25 – 29.9 kg/m^2
Group 4 (obese)	30 – 34.9 kg/m^2
Group 5 (Morbidly obese)	>35 kg/m^2

RESULTS

On the basis of inclusion and exclusion criteria, 400 patients were included in the study. The patients were comparable for their demographic profile. Based on BMI, patients were divided into five groups. Distribution of patients in different groups is shown in Table 2.

Table 2: Distribution of patients according to BMI.

Group	Number of Women
Group 1 (Underweight)	79 (19.75%)
Group 2 (Normal)	182 (45.5%)
Group 3 (Overweight)	104 (26%)
Group 4 (obese)	34 (8.5%)
Group 5 (Morbidly obese)	1 (0.25%)

The patients were compared on basis of presence of complications during antenatal period. Complications studied were PIH, anemia, gestational diabetes, IUGR and macrosomia. It was seen that incidence of anemia and IUGR was more associated with underweight patients while PIH, gestational diabetes and macrosomia was associated more with patients who were overweight, obese or morbidly obese. Patients with normal BMI had lower incidence of these complications. The occurrence of these complications was significantly related to BMI (Table 3).

Table 3: Comparison of complications during antenatal period based on BMI.

Complications	Group 1	Group 2	Group 3	Group 4	Group 5
PIH	3	5	9	4	-
Gestational diabetes	1	3	21	19	1
Anemia	21	18	3	1	-
IUGR	26	20	8	3	-
Macrosomia	-	2	9	4	-

There was more incidence of Lower segment Caesarean Section (LSCS) and instrumental delivery in patients with higher BMI. These patients also had increased incidence of wound sepsis and Postpartum hemorrhage (PPH). Difference is visible in Table 4 and 5.

Table 4: Comparison of mode of delivery.

Method of delivery	Group 1	Group 2	Group 3	Group 4	Group 5
LSCS	28	29	31	18	1
Instrumental delivery	14	42	29	7	-
Normal Vaginal delivery	37	111	44	9	-

Table 5: Complications in early postpartum period.

Complications in early postpartum period	Group 1	Group 2	Group 3	Group 4	Group 5
PPH	2	2	7	6	-
Wound sepsis	1	-	2	1	1

Small for gestational age (SGA) babies were seen more in patients with low BMI while Large for gestational age (LGA) babies were seen more in patients with high BMI. More babies in patients with low BMI or high BMI required NICU admissions. 1 perinatal death occurred in Group 4 due to sepsis.

Table 6: Comparison of neonatal outcome.

Neonatal outcome	Group 1	Group 2	Group 3	Group 4	Group 5
SGA	33	21	11	6	-
LGA	-	3	24	9	1
NICU admission	19	3	5	3	-
Perinatal death	-	-	-	1	-

DISCUSSION

Total of 400 pregnant women in first trimesters of pregnancy were included in the study based on inclusion and exclusion criteria and studied for various antenatal, intranatal and postnatal complications.

In our study it was seen that in antenatal period, incidence of anemia and IUGR were more common in patients who were underweight while PIH, gestational diabetes and macrosomia were more seen in patients with overweight and obese women. This finding was consistent with studies by Sahu MT et al (6), who showed that anemia and low birthweight was significantly present among lean women while obese women had a significant risk for gestational diabetes, pre-eclampsia, cesarean delivery and macrosomia. Verma A et al, showed that in the underweight group, the incidences of anemia and growth retardation were more, while the overweight and the obese women had a higher risk for PIH and gestational diabetes, Bhattacharya S et al, showed that morbidly obese women faced the highest risk of pre-eclampsia and underweight women the lowest (7,1). A meta-analysis of PIH associated with maternal BMI showed that risk of pre-eclampsia doubled with 5-7 kg/m2 increase in BMI (8).

The rate of caesarean section and instrumental vaginal delivery was associated more with higher BMI. Due to increased rate of cesarean section, these patients had higher rate of perioperative morbidity including anaesthetic problems, infections and prolonged hospitalization. We found an increased rate of wound sepsis in patients who were underweight or obese, patients with higher BMI showed an increased rate of PPH. Similar findings were seen in studies by Verma A et al, who showed higher incidence of LSCS and wound sepsis in overweight and obese women(7). Sahu MT et al, showed significantly higher incidence of cesarean delivery and macrosomia in overweight and obese women (6). Bhattacharya S et al, also demonsrated higher incidence of cesarean section and PPH in obese women while such incidences were less in underweight and normal women and also comparable (1). Bainco et al, however found no difference in incidence of PPH in relation to BMI (9).

CONCLUSION

Complications in pregnancy in antenatal period, during labour, postnatal period and adverse neonatal outcome was seen significantly more in patients on either side of BMI (underweight and obese). Hence from our study it reflects that BMI of a patient directly affects pregnancy outcome. It is thus advised to record BMI of all patients at their first visit and patients' weight be recorded at every consequent visit to ensure proper BMI and thus reduction of complications during pregnancy and ensuring a better neonatal outcome.

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