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Original Research Article

A Research of Gestation Outcomes with Respect to BMI in the First Trimester on Females from Central India

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Abstract

Background: The BMI (body mass index) in early gestation has a major impression on the gestation outcome. Lesser and raised BMI females are more likely to have an undesirable gestation outcome. According to the American College of Obstetricians and Gynecologists, all expectant females should have their BMI measured during their first appointment (ACOG).

Aim: The goal of this research was to see how females's BMI in the first trimester affected their maternal and fetal outcomes.

Materials and Methods: A prospective observational research was done in the Department of Obstetrics and Gynecology over a two-year period. A total of 300 expectant females in their first trimesters were screened for various prenatal and postnatal disorders based on inclusion and exclusion criteria.

Results: In under-weight subjects, anemia and intra-uterine growth restriction (IUGR) were found to be more prevalent. Postpartum hemorrhage (PIH), gestational diabetes, and macrosomia were all more common in subjects who were over-weight or obese. Subjects with a raiseder BMI were more likely to have a lesserer (uterine) segment caesarean section (LSCS), instrumental delivery, wound infection, and PPH. SGA babies were more common in lesser-BMI individuals, while LGA babies were more common in raised-BMI subjects. The neonatal critical care unit was more likely to admit subjects with a lesser or raised BMI (NICU).

Conclusion: Subjects with BMIs on either side experienced significantly more gestation difficulties, as well as severe gestation and newborn issues (under-weight and obese). As a result, it's reasonable to conclude that a patient's BMI has a direct bearing on the gestation's prognosis.

Keywords: Gestation induced hypertension, Postpartum hemorrhage, Intra-uterine growth restriction, Body mass index.

Introduction

The BMI has a substantial impression on the gestation outcome in the early stages of gestation. Gestation outcomes are dismal for both females with a lesser BMI and those

with a raised BMI [1] . A person's BMI is calculated by multiplying their weight in kilograms by their squared height in meters. (BMI=kg/m2). Obesity has been on the rise in recent years. Gestation outcomes are harmed by raised BMI before gestation and/or excessive gestational weight gain (GWG), which increases the burden of chronic diseases and jeopardizes the health of both the mother and the infant [2]. Females with a raiseder BMI are more prone to develop gestational diabetes, gestation-induced hypertension, postpartum hemorrhage, caesarean section, shoulder dystocia, difficult labor, macrosomia infants, aided delivery, birth asphyxia, and postpartum hemorrhage [3-5]. Females with a lesser BMI are at risk for preterm birth, lesser birth weight, anemia, and prematurity. Maternal BMI and maternal nutrition should be given suitable importance during gestation and should be a standard feature of antenatal evaluation to support a favorable mother and baby result6. All expectant females should have their BMI measured at their first appointment, according to the American College of Obstetricians and Gynecologists [6] . Because gestational weight gain is a modifiable risk factor in gestation, raisedlighting its importance during prenatal care can help mothers and babies do better. The Institute of Medicine has established weight-gain guidelines for expectant females [7].

Aims & objectives: The goal of this research was to look at maternal and fetal outcomes in subjects with raised and lesser BMIs in order to guarantee that these subjects are closely monitored to achieve a good maternal and fetal outcome.

Materials and Methods

This was a two-year prospective observational research conducted in the Obstetrics and Gynecology Department. Subjects with a singleton gestation who booked in the first trimester of gestation were eligible to participate. The research excluded females who had many pregnancies, as well as those who had diabetes, severe hypertension, heart disease, or hypothyroidism. Subjects who met these requirements were enrolled in the research and given a full history and physical. Subjects were divided into five categories based on WHO and National Institute of Health recommendations (Table 1). Subjects were thoroughly observed during the entire expectant time. The amount of weight gained was kept track of. There were issues with prenatal, postnatal, maternal, and fetal development.

Results

There were 300 subjects in the trial that met the inclusion and exclusion criteria. The subjects were comparable in terms of demographics. The BMI of the subjects was used to divide them into five categorys.

Table 1: Distribution of subjects based on BMI.

Category	BMI
Category I (Under-weight)	≤ 19.9 kg/m2
Category II (Normal)	20-24.9 kg/m2
Category III (Over-weight)	25-29.9 kg/m2
Category IV (Obese)	30-34.9 kg/m2
Category V (Morbidity Obese)	>35 kg/m2

Table 2: Distribution based on BMI of subjects

Category	**BMI**	**No. of subjects**	**% of subjects**
Category I (Under-weight)	≤ 19.9 kg/m2	46	15.3%
Category II (Normal)	20-24.9 kg/m2	160	53.3%

Category III (Over-weight)	25-29.9 kg/m2	60	20%
Category IV (Obese)	30-34.9 kg/m2	34	11.4%
Category V (Morbidity Obese)	>35 kg/m2	0	0

Table 2 reveals that the majority of subjects (53.3%) had a BMI of 20-24.9 kg/m2, with over-weight (20%) having a BMI of 25-29.9 kg/m2, under-weight (15.3%) having a BMI of 19.9 kg/m2, and obese (11.4%) having a BMI of 30-34.9 kg/m2.

Table 3: Distribution on basis of complications during antenatal period according to BMI

BMI Category	I (n=46)	II (n=160)	III (n=60)	IV (n=34)	P value
PIH	2(4.35%)	2(1.25%)	6 (10%)	6(17.6%)	<0.01
Gestational Diabetes	2(4.35%)	20 (12.5%)	22 (36.6%)	16 (47%)	<0.01
Anemia	10 (21.7%)	16 (10%)	8 (13.3%)	2 (5.9%)	<0.05
IUGR	20 (43.5%)	20(12.5%)	10 (16.6%)	8 (23.5%)	<0.05
Macrosomia	0	2 (1.25%)	2 (3.3%)	6 (17.6%)	<0.01

The subjects were compared in Table 3 based on the occurrence of prenatal issues. As complications, PIH, anemia, gestational diabetes, IUGR, and macrosomia were studied. Under-weight subjects were shown to have raiseder rates of anemia and IUGR, whereas over-weight or obese subjects had raiseder rates of PIH, gestational diabetes, and macrosomia. Subjects with a normal BMI had less of these issues. The occurrence of these issues was found to be strongly associated to BMI.

Table 4: Distribution based on delivery mode

Delivery Mode	I (n=46)	II (n=160)	III (n=60)	IV (n=34)	P value
LSCS	18(39.1%)	50(31.3%)	28(46.6%)	14(41.2%)	<0.05
Instrumental	2(4.35%)	10(6.3%)	4(6.6%)	4(11.8%)	<0.01
Normal Vaginal	26(56.5%)	100(62.5%)	28(46.6%)	16(47%)	<0.05

Subjects with a raiseder BMI had a raiseder rate of LSCS and instrumental delivery, as seen in Table 4. The difference was considered to be statistically significant.

Table 5: Distribution on basis of complications in early postpartum period

Complications	I (n=46)	II (n=160)	III (n=60)	IV (n=34)	P value
PPH	4(8.7%)	6(3.75%)	8(13.3%)	6(17.6%)	<0.05
Wound sepsis	6(13.04%)	4(2.5%)	4(6.6%)	6(17.6%)	<0.05

Wound sepsis and PPH were also more common in these subjects, as seen in Table 5. The difference was considered to be statistically significant.

Table 6: Distribution based on neonatal outcome

Neonatal outcome	I (n=46)	II (n=160)	III (n=60)	IV (n=34)	P value
SGA	20 (43.5%)	18(11.25%)	10(16.6%)	14(41.2%)	<0.05
LGA	0	2(1.25%)	6(10%)	8(23.5%)	<0.01
NICU admission	4(8.7%)	2(1.25%)	8(13.3%)	4(11.8%)	<0.05
Perinatal death	0	0	0	0	0

Subjects with a lesser BMI had more SGA babies, while those with a raised BMI had more LGA kids, as seen in Table 6. NICU admissions were required for a greater

number of babies among those with a lesser or raised BMI. A statistically significant difference existed. In none of the categorys, there were any prenatal deaths.

Discussion

In the Department of Obstetrics and Gynecology, a two-year prospective observational research was conducted. A total of 300 expectant females in their first trimesters were screened for various prenatal and postnatal disorders based on inclusion and exclusion criteria. The demographic profiles of subjects with similar demographic traits were compared [8-10]. Anemia and IUGR were more common in our research in subjects who were under-weight [lesserer BMI (category 1)] during the antenatal period, whereas PIH, gestational diabetes, and macrosomia were more common in subjects whose mothers were over-weight or obese (category III and IV). Obese females had a raiseder risk of gestational diabetes, pre-eclampsia, caesarean delivery, and macrosomia, according to studies conducted by Prachi Srivastava and Sahu MT et al. Obese females had a raiseder risk of gestational diabetes, pre-eclampsia, caesarean delivery, and macrosomia, according to studies conducted by Prachi Srivastava and Sahu MT Under-weight females had a raiseder risk of anemia and development retardation, while over-weight and obese females had a raiseder risk of PIH and gestational diabetes, according to Verma A et al. According to Bhattacharya S et al., females who were morbidly obese had the raisedest risk of pre-eclampsia, whereas females who were under-weight had the lesserest risk [11]. The raiseder the pre-gestation BMI, the greater the risk of gestation-induced hypertension and gestational diabetes mellitus, according to Fujiwara K et al. The most common maternal outcomes associated with obesity and over-weight, according to Takai IU et al., were hypertensive disorders in gestation (42.0 percent) and gestational diabetes mellitus (41.3 percent) [12]. In a meta-analysis of PIH and maternal BMI undertaken by O'Brien et al., the risk of pre-eclampsia rose with every 5-7 kg/m2 increase in BMI. A raiseder BMI was connected to a raiseder rate of caesarean section and vaginal delivery with assistance. Due to the raised rate of caesarean section, these subjects had a greater rate of perioperative morbidity, such as anesthetic issues, infections, and prolonged hospitalization. Subjects who were under-weight or obese had a raiseder rate of wound sepsis, and subjects with a raiseder BMI had a raiseder rate of PPH, according to our findings. In a research conducted by Verma A et al., it was discovered that LSCS and wound sepsis are more likely in over-weight and obese females [13]. According to Sahu MT et al., obese and over-weight females had a significantly raiseder rate of caesarean delivery and macrosomia. Obese females had a raiseder rate of caesarean section and PPH, while under-weight and normal females had lesserer rates and were equivalent, according to Bhattacharya S et al. According to Fujikara K et al & Takai IU et al., females with a raiseder BMI had a raiseder rate of caesarean section and PPH. They also found a raiseder rate of caesarean section in over-weight and obese females, but a raiseder rate of PPH in normal weight females than over-weight or under-weight females, which they attributed to likely less labor monitoring in normal weight females compared to under-weight, over-weight, or obese females. However, Bainco et al. found no correlation between BMI and the incidence of PPH. Under-weight subjects had a raiseder rate of lesser birth weight, whereas over-weight and obese females had a raiseder rate of large for date newborns. Verma A et al., Sahu MT et al., Bhattacharya S et al., Fujikara K et al., and O'Brien TE et al. all arrived at the same conclusion. According to studies by Sebire NJ et al and Weiss JL et al, obese females have an 18-26 percent likelihood of delivering large for date infants compared to females

with a normal BMI. Because of IUGR, NICU admissions were more common in the under-weight category, whereas macrosomia and maternal diabetes were more common in the over-weight and obese category. The percentage of macrosomic babies grew from 16.7% to 20.9 percent in ten years, according to Orskou J et al., with increasing mother BMI being one of the main causes. Expectant females in the BH Narayani et al. research were on average 26.2 years old [14]. At the time of booking, obese females were found to be significantly older (28.0 years) than other females. Obese females (8.25 percent) had a significantly greater diabetes family history than other females. Females who were obese had more caesarean sections than females who were not obese. In comparison to the other categories, obesity was linked to a raiseder risk of macrosomia. [15] Preeclampsia was substantially more common in obese females (1.89 percent) than in other females.

Conclusion

Subjects with BMIs on either side had significantly more gestation difficulties during the prenatal phase, labor, and postnatal period, as well as a poor neonatal outcome (under-weight and obese). We did not include a morbidly obese category in our research. As a result, it's reasonable to conclude that a patient's BMI has a direct bearing on the gestation's prognosis. All subjects' BMI should be recorded during their initial appointment, and subjects' weight should be documented at every subsequent visit to maintain ideal BMI and thereby prevent complications throughout gestation and provide a better neonatal result.

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