The trend of BMI (Body Mass Index) in pregnant women delivering in a tertiary hospital in South India and the pregnancy outcomes in the different BMI groups

Author: RIDA PHYLLA NONGRUM
Department of Obstetrics and Gynaecology, CHRISTIAN MEDICAL COLLEGE

Abstract: Introduction: Published data showed that India has a problem of dual malnutrition with obesity on the rising trend inspite of many being underweight. Few data is available on the pregnancy outcome in the different BMI (Body Mass Index) groups. The aim of this research is to study the trend of BMI in pregnant women delivering in CMC Vellore and to assess the pregnancy outcome in the different BMI groups. Methods: Primigravidas with a documented BMI at less than 15 weeks gestation or who had a documented prepregnancy weight and received prenatal care at the Department of Obstetrics and Gynaecology, Christian Medical College, Vellore, Tamil Nadu, India, were enrolled in the present study between June 2011 and November 2011. Approval by the Institutional Review Board was obtained. The antenatal and labour record of the eligible women were screened after a written informed consent. The BMI (body mass index) was calculated as weight in kilograms divided by the square of height in meters. The women were classified as underweight if their BMI was less than 20.0, normal if it was 20.0 to 24.9, overweight if it was 25.0-29.9 and obese if it was equal to or more than 30. Data were collected using a structured questionnaire. Statistical analysis was carried out using SPSS 16.0. Maternal age was compared across the 4 BMI groups using the Fisher exact and chi-square tests. Descriptive statistics was used to analyse the pregnancy outcome in the different BMI groups. Results: Of the 86 women enrolled, 25 (29.1%) were underweight, 37 (43.0%) were normal weight, 12 (14.0%) were overweight and 12 (14.0%) were obese. Gestational diabetes was noted in 25 percent each of obese and overweight women whereas only 8 of the 37 normal weight women (21.6%) developed gestational diabetes. Induced labor was also common in the obese and overweight group compared to the normal weight women-75 percent and 51.4 percent respectively. Caesarean delivery was more in the obese group (33.3 percent) and less common in the other BMI groups. 5 out of 25 women (20 percent) in the underweight group had low birth weight babies. Conclusion: Pregnancy complications were noted in the obese, overweight and underweight BMI groups, but the risk ratio cannot be calculated due to a small sample size. A larger study is required to study the pregnancy outcome in the different BMI groups. Keywords: BMI (Body Mass Index), pregnancy outcome, obesity, underweight. According to the WHO, an estimated 2.3 billion adults worldwide will be overweight and more than 700 million adults will be obese by the year 2015 (1). Obesity is showing a rising trend in many developing countries too. In India, the prevalence of obesity is increasing owing to the improvement in economy and rapid industrialization and urbanization. Data from the National Family Health Surveys in India have shown an increase in obesity in women from 10.6% in 1998-1999 to 14.8% in 2005-2006, although about 36% women still have a BMI of less than 18.5 kg/m². Thus India has a problem of dual malnutrition with nearly half of women being either underweight or overweight. Obesity was however more common in those belonging to the higher socioeconomic status and living in urban areas (3). Pregnancy-related complications like subfertility, early spontaneous abortion, gestational diabetes, pre-eclampsia and late fetal death are more common in obese women compared to a woman with normal weight. Obese women are also more likely to have caesarean and/or instrumental delivery. (4). Underweight women, however, have been shown to have a higher prevalence of preterm delivery and low birth weight (5). There are many published reports on the prevalence of obesity in adolescents and general population and few studies on maternal obesity and pregnancy outcome. There are fewer studies to compare the outcomes of pregnancy in the different BMI groups. Between June 2011 and November 2011, 86 primigravidas who had a documented BMI at <15 weeks gestation or who had a documented prepregnancy weight and received prenatal care at the Department of Obstetrics and Gynaecology, Christian Medical College, Vellore, Tamil Nadu, India, were enrolled in the present study. The study was approved by the Institutional Review Board and a written informed consent was obtained from all the participants. The mean age of the women was 24.29±3.6 years (18-33 years). The women were approached for the study at admission to labour room. The antenatal record of the women were screened and those with a documented BMI at <15 weeks gestation or documented prepregnancy weight were enrolled in the study. BMI was calculated as weight in kilograms divided by the square of height in meters. The women were classified as underweight if their BMI was less than 20.0, normal weight if it was 20.0 to 24.9, overweight if it was 25.0-29.9 and obese if it was equal to or more than 30. Data were collected using a structured questionnaire. Statistical analysis was carried out using SPSS 16.0. Maternal age was compared across the 4 BMI groups using the Fisher exact and chi-square tests. The pregnancy outcome in the different BMI groups was analyzed by descriptive statistics. Of the 86 women enrolled, 25 (29.1%) were underweight.
37(43.0%) were of normal weight,12(14.0%)were overweight and 12(14%) were obese. Characteristics such as maternal age in relation to BMI is shown in Table.1.

Table 1

<table>
<thead>
<tr>
<th>Maternal characteristics among underweight,normal weight,overweight and obese women(n=86)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Values are given as number(percentage)unless otherwise indicated Abbreviation:BMI,body mass index(calculated as weight in kilograms divided by the square of height in meters)</td>
</tr>
</tbody>
</table>

The pregnancy complications among underweight,normal weight,overweight and obese women is shown in Table.2.

Table 2

<table>
<thead>
<tr>
<th>Pregnancy outcomes among underweight,normal weight, overweight and obese women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Values are given as number(percentage)unless otherwise indicated</td>
</tr>
</tbody>
</table>

Pregnancy related complication like pregnancy induced hypertension(PIH) was seen in 10.8% of normal weight women and 25% of obese women. There was no PIH noted in the underweight and overweight group. Gestational diabetes occurred in 3 out of 12 women in the obese and overweight groups, whereas only 8 of the 37 normal weight women developed gestational diabetes. 68% of women in the underweight group had induced labour compared to 51.4% in the normal weight women. Labour was induced in 9 of the 12 women in both the overweight and obese groups. The indications for induction of labour were past dates, prelabour rupture of membranes, PIH and gestational diabetes. Three women in the normal weight group had postpartum hemorrhage, whereas only one woman each in the underweight and obese group had PPH (PPH). None of the women in the obese or overweight group had any postpartum fever. 20% women in the underweight group had babies with intrauterine growth restriction. IUGR was less common in the normal, obese and overweight groups. The overall mean weight of the neonates was 3.04±0.47 kg. The mean birth weight was 2.9±0.43 kg among underweight women, 3.07±0.50 kg among normal weight women, 3.04±0.51 kg among overweight women and 3.19±0.43 kg among obese women.

Published reports indicate that obesity in women is on the rising trend even though undernutrition stillexists(2). In the present study we found about 29 % of women are underweight even though about 14% are overweight and an equal number are obese. Studies from developed countries have shown that obesity as well as underweight women are at an increased risk of pregnancy related complications(5)(6). In the present study the risk ratio for outcomes in the 4 BMI groups could not be calculated due to a small sample size, which is one of the limitation of this study. Nevertheless, pregnancy related complications in the underweight, overweight and obese group was noted. Thus it is necessary to plan and implement preventive strategies to improve the nutritional status of underweight women on one hand and to control the rising level of obesity on the other. A larger study is necessary and a plan to continue the present research has been made to analyse the pregnancy outcome in the various BMI groups.

References: