Obesity and its outcome among South African pregnant adolescents

JK Basu, D Basu

Obesity is an epidemic that affects all age groups, including adolescents. Obesity studies on pregnant adolescents are few in number. This pilot study was conducted to determine the obesity prevalence and complications among pregnant South African adolescents. A retrospective review of 54 pregnant adolescents was carried out over a two-month period at the Charlotte Maxeke Johannesburg Academic Hospital. Adolescents were divided into different body mass index categories, and the data were compared. Descriptive statistics (mean ± standard deviation, and median with interquartile range) and inferential statistics (unpaired t-test and analysis of variance) were analysed. Twenty-six per cent of the adolescents were obese. Six per cent of the adolescents were morbidly obese, and experienced greater

Introduction

Adult obesity during pregnancy has been studied extensively. However, studies on obese adolescents and their pregnancy outcomes are rare. In a large retrospective study, six per cent of the deliveries were adolescent, and 28% were overweight or obese. Increased body mass index (BMI) was associated with higher parity, pregnancy-induced hypertension, gestational diabetes mellitus, induction of labour, and Caesarean sections.

In another large retrospective study among 10,322 deliveries, 712 (7%) deliveries were adolescent, of which 458 adolescents were eligible for the study. The study reported that only gestational diabetes mellitus and Caesarean sections increased among the overweight (106, 23%) and obese (78, 17%) adolescents. Additionally, BMI was shown to increase in winter.

There are no published studies that focus on obesity among South African pregnant adolescents. Therefore, this pilot study was conducted to determine the prevalence of obesity, and its outcome, among pregnant adolescents at the Charlotte Maxeke Johannesburg Academic Hospital (CMJAH).

Method

A cross-sectional study was carried out through retrospective review of the records of all adolescent (aged 19 years and less) mothers who delivered at the CMJAH in February and September 2006. The World Health Organization’s classification of BMI (normal 18.5-24.9, overweight 25-29.9, obese 30-39.9, and morbidly obese > 40) was used to categorise the adolescents. BMI was taken at the first antenatal visit, and analysed. The adolescents were divided into BMI categories, and the data were compared. Descriptive statistics (mean ± standard deviation, and median with interquartile range) and inferential statistics (unpaired t-test and analysis of variance) were used. The human ethics research committee of the University of the Witwatersrand approved the study.

Results

From a total of 767 deliveries, 54 (7%) were adolescent, during the two-month period. There were 16 (30%) normal, 24 (44%) overweight, 11 (20%) obese, and three (6%) morbidly obese adolescents.
The mean BMI was 28.1 ± 5.9. Mean BMI was compared in summer (February) and spring (September), and it was significantly (unpaired t-test, p-value = 0.002) increased in spring (30 ± 7.5), compared to summer (26 ± 3.2).

Fifty-one (94%) adolescents were African, and ethnicity was not different (ANOVA, p-value = 0.80) among different groups. The median age and the mean booking gestational age were 18 (IQR 13-19) years, and 26 (SD ± 5.6) weeks respectively.

Twenty-five (46%) adolescents were multigravidas. There were two (12%), 16 (67%), five (45%) and two (67%) multigravidas in the normal, overweight, obese, and morbidly obese groups, respectively, and parity was significantly higher in the obese and morbidly obese groups (see Table I).

There was no gestational diabetes mellitus. Antenatal complications were compared (see Table II).

Mean gestational age at delivery (normal 38 ± 2.8 weeks, overweight 39 ± 2.2 weeks, obese 39 ± 1.7 weeks, and morbidly obese 39 ± 3.4 weeks) was not different (ANOVA, p-value = 0.69) among the categories.

Mode of delivery [normal: 10 (63%) vaginal, five (31%) Caesarean sections, one (6%) assisted delivery; overweight: 12 (50%) vaginal, 12 (50%) Caesarean sections; obese: six (55%) vaginal, five (45%) Caesarean sections; and morbidly obese: two (67%) vaginal, one (33%) Caesarean section]; was not different (ANOVA, p-value = 0.92) among the groups.

Mean birthweight of baby (normal: 3 134 g ± 724.17; overweight: 3 174 g ± 506.78; obese: 3 195 g ± 416.51; and morbidly obese 3 216 g ± 710.51) was not different (ANOVA, p-value = 0.99) among the groups.

**Discussion**

The results show both similarities and differences, when compared to other studies. The prevalence of overweight (44%) and obesity (20%) in this study was higher than that recorded in previous studies. In this study, the finding of morbid obesity in a large number (6%) of adolescents during pregnancy was a new observation, as it has not been reported in previous studies.

It was a novel idea to compare BMI in pregnant adolescents during two different seasons. This has never been reported previously. The increased weight gain recorded in February was similar to the increased weight gain in September among non-pregnant adult women.

Morbidly obese adolescents booked at an antenatal clinic much later in their pregnancies. This finding was different to that of a previous study in which the mean antenatal booking gestational age was 15 weeks for all BMI groups. Although there were no significant differences in antenatal complications in the groups, the rate of post-date deliveries, pregnancy-induced hypertension, preterm labour and induction of labour, was higher in the morbidly obese group. The previous study showed a significantly higher rate of all such complications in the obese group.

The gestational age at delivery was linearly increased in the overweight, obese, and morbidly obese groups in this study, whereas previous studies reported a significantly higher gestational age at delivery in the obese group. Overweight and obese adolescents had more Caesarean section deliveries, similar to the findings of previous studies.

Birthweight increased with increasing BMI, a similar finding to

---

**Table I: Demographic profile of study participants**

<table>
<thead>
<tr>
<th></th>
<th>Normal</th>
<th>Overweight</th>
<th>Obese</th>
<th>Morbidly obese</th>
<th>p-value (ANOVA)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (mean ± SD)</strong></td>
<td>16 ±1.7</td>
<td>19 (15-19)</td>
<td>18 ± 1.4</td>
<td>16 ± 3.2</td>
<td>0.02d</td>
</tr>
<tr>
<td><strong>Parity (median + IQR)</strong></td>
<td>0 (0-1)</td>
<td>1 (0-2)</td>
<td>0 (0-4)</td>
<td>1 (0-3)</td>
<td>0.02d</td>
</tr>
<tr>
<td><strong>Booking GA (weeks) (mean ± SD)</strong></td>
<td>25 ± 1.7</td>
<td>28 ± 5.8</td>
<td>25 ± 4.5</td>
<td>31 ± 5.1</td>
<td>0.19</td>
</tr>
</tbody>
</table>

a = analysis of variance, b = standard deviation, c = median value (interquartile range) is presented as data were not normally distributed, d = significant results, e = interquartile range, f = gestational age

**Table II: Antenatal complications**

<table>
<thead>
<tr>
<th></th>
<th>Normal n (%)</th>
<th>Overweight n (%)</th>
<th>Obese n (%)</th>
<th>Morbidly obese n (%)</th>
<th>P-value (ANOVA)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Postdates</strong></td>
<td>4 (27)</td>
<td>7 (29)</td>
<td>3 (27)</td>
<td>2 (67)</td>
<td>0.20</td>
</tr>
<tr>
<td><strong>Pregnancy-induced hypertension</strong></td>
<td>1 (6)</td>
<td>3 (13)</td>
<td>1 (9)</td>
<td>1 (33)</td>
<td>0.59</td>
</tr>
<tr>
<td><strong>Preterm labour</strong></td>
<td>4 (25)</td>
<td>4 (17)</td>
<td>0 (0)</td>
<td>1 (33)</td>
<td>N/Ae</td>
</tr>
<tr>
<td><strong>Induction of labour</strong></td>
<td>2 (13)</td>
<td>2 (8)</td>
<td>2 (18)</td>
<td>1 (33)</td>
<td>0.62</td>
</tr>
</tbody>
</table>

a = n = 16, b = n = 24, c = n = 11, d = n = 3, e = not applicable
that reported in previous studies.\textsuperscript{4,5} The small sample size of this study might have prevented some results from obtaining statistical significance. This is a limitation. Nevertheless, the study reflected a similar global pattern, of high prevalence of obesity, and its associated complications in pregnancy among South African adolescents. A larger study that focuses on obesity, and particularly on obesity in pregnant adolescents in South Africa, is necessary.

**Declarations**

The authors declare no conflict of interest. They have not received any funding from any authority to conduct this study.

**References**