

## Obstetric Performance of Nigerian Obese Parturients

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### Abstract

**Context:** Obesity constitutes a health hazard and the greater the degree of obesity, the greater the health risks. This is especially so in obstetric practice where complications of pregnancy are reportedly greater in obese patients.

**Objectives:** To determine the prevalence of obesity and to compare the outcome of pregnancy between obese and non-obese patients.

**Material and Methods:** A review of the case records over a five-year period at a Nigerian teaching hospital to identify obese patients who delivered babies was done. Outcome of pregnancy in the 205 obese patients identified (using a weight of 90 kg and above as cut-off) was compared with 206 controls.

**Results:** The incidence of obesity in pregnancy was 7.4%. The obese patients were older than the controls ( $p < 0.05$ ). There was no significant difference in socio-economic status in the two groups. More of the obese patients were multiparous ( $p < 0.01$ ). Preeclampsia was significantly more common in the obese group ( $p < 0.001$ ). The caesarean section rate was also higher in the obese group ( $p < 0.001$ ). The incidence of fetal macrosomia was higher in the obese group ( $p < 0.001$ ).

**Conclusion:** Obesity increased the risk of preeclampsia and fetal macrosomia and operative deliveries. The risk of birth asphyxia and perinatal mortality were not increased by obesity.

**Key Words:** Obesity, Parturient, Maternal, Neonatal, Outcome. [Trop J Obstet Gynaecol, 2002, 19: 00-00].

### Introduction

Obesity constitutes a health hazard and the greater the obesity, the greater the health risks<sup>1,2,3</sup>. It is defined as a body mass index greater than 29 kilogrammes per square metre ( $\text{kg}/\text{m}^2$ )<sup>4,5</sup>. In obstetrics, the attainment of a critical weight of 90kg or more sometime during pregnancy is regarded as obesity,<sup>6,7</sup> while pregnant women weighing 114kg or more at anytime during pregnancy are regarded as massively obese<sup>8</sup>.

Obstetric complications associated with obesity include pre-eclampsia and eclampsia, gestational diabetes mellitus, infections, malpresentation, and an increased rate of operative deliveries<sup>5, 9, 10</sup>. Thrombo-embolic phenomena are also common as are difficult and prolonged labours due to the poor quality of the abdominal muscles, non-engagement of the fetal head in the presence of fat within the pelvis and ineffective uterine contractions<sup>6, 9, 12</sup>. In the puerperium, obesity may be complicated by postpartum hemorrhage<sup>6</sup> as well as an increased incidence of wound breakdown<sup>8, 12</sup>. The fetal outcome in the obese obstetric patient is often poor, with increased risk of macrosomia<sup>7</sup> and congenital abnormalities such as neural tube defects<sup>6</sup>. Thus perinatal morbidity and mortality are higher than in the general population<sup>6, 9</sup>. Maternal mortality is similarly increased in the obese parturient patient. This study was therefore undertaken to determine the prevalence of obesity among pregnant women receiving care in our institution and to compare their obstetric outcome with that of non-obese parturients.

### Materials and Methods

The maternity records of patients with a weight of 90kg or more as at the last antenatal visit before delivery at the University College Hospital (UCH), Ibadan between 1<sup>st</sup> of January 1995 to 31<sup>st</sup> of December, 1999; a five (5) year period were collected, reviewed and used as test subjects. During the same period, a second group of parturient women who weighed less than 90 kg at the last antenatal visit before delivery were obtained by simple random sampling technique and served as controls. The choice of critical weight was based on the recommendation of Treharn<sup>6</sup> for situations where the pre-pregnancy weight is unknown. Most patients did not have the pre-pregnancy weight recorded.

Only patients who booked in UCH and were delivered in the hospital were recruited for the study. The patients were weighed in the antenatal clinic without their shoes on, using the single scale available in the clinic for the measurements, which were recorded in kilogrammes. Patients who were non-Nigerians and those with multiple pregnancies were excluded from the study. In the period under review, there were 4,134 deliveries in the hospital of which 3,104 (75.0%) were in booked patients.

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A total of 234 patients were found to be obese. Of these, 205 met the inclusion criteria and had sufficient data for analysis. Data were collected on the maternal age, tribe, parity, social class, booking weight and height, and the weight at the last antenatal clinic visit. Other parameters evaluated included complications of the antenatal period, labour and puerperium as well as the fetal outcome. The data were analysed using the statistical module of EPI-INFO software. Frequencies and correlations were generated and the chi-square test was used, with the level of significant set at  $p < 0.05$ .

**Results**

During the period under review, there were 3,104 deliveries of booked patients in the hospital and two hundred and thirty (7.4%) were obese Nigerians with singleton pregnancies. The sociodemographic profile of the patients is shown in Table 1. In the obese group 118 (57.6%) were aged 30-39 years while 85 (41.3%) of the control were in the same age range. The difference in age distribution was statistically significant ( $p < 0.001$ ). There were 139 and 101 multiparous patients in the test and control groups respectively. This difference was also statistically significant ( $p < 0.01$ ).

**Table 1**  
**Socio-Demographic Profile of the Patients**

	<b>Obese</b> No. (%) N = 205	<b>Control</b> No. (%) N =206	<b>p</b>
<b>Ethnic Distribution</b>			
Yoruba	159 (77.9)	164 (79.6)	NS
Ibo	29 (14.2)	13 (6.3)	
Hausa	1 (0.5)	8 (3.9)	
Others	15 (7.4)	21 (10.2)	
<b>Marital Status</b>			
Single	0 (0)	7 (3.4)	NS
Married	205 (100)	198 (96.1)	
Divorced	0 (0)	1 (0.5)	
<b>Age Distribution</b>			
< 20 years	0 (0)	2 (1.0)	< 0.05*
20 – 29 years	79 (38.5)	118 (57.3)	
30 – 39 years	118 (57.6)	85 (41.3)	
≥ 40 years	8 (3.9)	1 (0.5)	

\*The obese patients tended to be aged over 30 years while the controls were more likely to be under 30 years old.

NS: Not statistically significant.

**Table 2**  
**Complications of Pregnancy, Labour and the Puerperium**

	<b>Obese</b> No. (%) N = 205	<b>Control</b> No. (%) N =206	<b>p</b>
<b>Complication</b>			
Essential Hypertension	5 (2.4)	3 (1.5)	NS
Pre-eclampsia	39 (19.0)	9 (4.4)	< 0.05
Overt Diabetes Mellitus	1 (0.5)	0 (0)	NS
Gestational Diabetes Mellitus	5 (2.4)	1 (0.5)	NS
Urinary Tract Infection	9 (4.4)	4 (1.9)	NS
Anaemia	6 (2.9)	5 (2.4)	NS
Antepartum Haemorrhage	9 (4.4)	4 (1.9)	NS
Malpresentation	10 (4.9)	4 (1.9)	NS
Thromboembolic Disease	1 (0.5)	0 (0)	NS
Preterm Gestation	23 (11.3)	33 (16.0)	NS
Post-term Gestation	5 (2.4)	4 (1.9)	NS
<b>Labour</b>			
Cephalopelvic Disproportion	4 (2.0)	1 (0.5)	NS
Delayed Second Stage	6 (3.0)	1 (0.5)	NS
Shoulder Dystocia	4 (2.0)	0 (0)	NS
Retained Placenta	1 (0.5)	3 (1.5)	NS
Genital Laceration	9 (4.4)	2 (1.0)	NS
<b>Puerperium</b>			
Wound/Episiotomy Infection	5 (2.4)	2 (0.9)	NS
Post partum Haemorrhage	6 (2.9)	3 (1.5)	NS
Eclampsia	1 (0.5)	0 (0)	NS
Death	1 (0.5)	0 (0)	NS

NS: Not statistically significant.

The complications of pregnancy, labour and puerperium are shown in Table 2. There were thirty-nine (19.0%) obese patients who had pre-eclampsia while only 9 (4.4%) of the control had the condition. The difference between both groups was statistically significant ( $p < 0.0004$ ).

One hundred and thirty one (63.9%) of the obese patients had spontaneous vaginal delivery compared to one hundred and seventy-nine (87.1%) of the control patients (Table 3). The difference was statistically significant ( $p < 0.001$ ). Similarly, there was a statistically significant difference in the caesarean section rate in both study population with 61 (30.1%) obese and 23 (10.9%) control subjects having been delivered by caesarean section ( $p < 0.001$ ).

Fifty (24.6%) of the obese patients had infants weighing more than 4.0 kg at birth while the corresponding figure for the non-obese patients was 7 (3.4%). The difference was statistically significant ( $p < 0.001$ ). The result also shows that 12 (5.6%) and 23 (11.2%) of the obese and control groups respectively had babies that weighed less than 2.5kg at birth. The difference was not statistically significant.

Only 24 (11.7%) of the obese infants had asphyxia at 1 minute of life compared with 20 (9.7%) of the non-obese control group. The difference was not statistically significant ( $P > 0.05$ ). The stillbirth rate in the 2 groups was similarly not significant.

**Table 3**  
**Mode of Delivery in the Patients**

	<b>Obese</b> No. (%) N = 205	<b>Control</b> No. (%) N = 206	<b>p</b>
<b>Mode of Delivery</b>			
Spontaneous Vaginal	131 (63.9)	179 (87.1)	<0.05
Assisted Breech	6 (2.7)	3 (1.5)	NS
Forceps/Vacuum	7 (3.3)	1 (0.5)	NS
Caesarean Section	61 (30.1)	23 (10.9)	<0.05

**Discussion**

The problem of obesity is global with regional variation in prevalence and indeed it has become a problem with public health magnitude <sup>11,12</sup>. The incidence of obesity in pregnancy obtained in this study is 7.4% or 1 in 14 deliveries. This figure is lower than the 10.1% reported at Cleveland, Ohio in the United States of America.<sup>7</sup> The difference might be due to the difference in prevalence of obesity in the different populations.

The study showed that majority of the obese (50.3%) had tertiary education. In addition, 80.5% of their husbands belong to the class of professionals, top civil servants and businessmen and as such were of high socio-economic status and, therefore, of a relative affluence. This is consistent with the findings of other authors that obesity is associated with affluence among other factors <sup>11,12</sup>.

The study also showed that obese patients are more likely to be multiparous than the non-obese patient. The relationship between parity and obesity shown in this study is in agreement with the reports of other workers <sup>7</sup>. This might be related to the relative advanced maternal age found in the obese subjects.

The incidence of pre-eclampsia obtained in this study (19.0%) is significantly higher than in the control group. This result is in agreement with those reported by some workers<sup>8,9</sup>. Fields *et al* however observed a negative association between maternal obesity and the development of pre-eclampsia.<sup>13</sup>

A high incidence of diabetes mellitus complicating obesity in pregnancy has been reported by other workers <sup>4,8,10</sup>. However, findings in this study, as in those of Effiong <sup>9</sup>, did not support this association. This may be due to the sample size not being large enough to prove the prevalence of diabetes mellitus in the obese subjects.

As in the findings of other workers, the incidence of caesarean section was significantly higher in the obese than in the non-obese patients <sup>5,9,10</sup>. The indications for caesarean section were mainly severe pre-eclampsia, fetal distress and failure to progress in labour. Also a high incidence of operative vaginal delivery has been associated with obesity <sup>6,7,12</sup> but this was not confirmed in this study. This might be attributed to institutional biases for instrumental vaginal deliveries.

With regards to the effect of maternal obesity on infant birth weight, this study showed that obese mothers delivered more macrosomic infants than the non-obese control. The difference was statistically significant and was consistent with the findings in other previous reports.<sup>7, 12</sup> The differences in the Apgar scores of the infants in the two groups at 1 and 5 minutes were not statistically significant. This is surprising considering the higher incidence of complications associated with obesity in pregnancy, but could be due to early anticipation of these complications and institution of appropriate interventional measures as practised in our centre. In addition the perinatal mortality in the obese patients was not significantly different from the control group. This is in agreement with the findings of Gross *et al*,<sup>7</sup> but was at variance with other reports <sup>6, 9</sup>. The observed lack of increase in perinatal mortality obtained in this study may be related to the lower incidence of preterm delivery and intrauterine growth retardation associated with maternal obesity as obtained in the study. In addition the women were booked and had intensive perinatal care whenever there was superimposed medical complications of pregnancy, thus contributing to the favourable outcome of infants in this study. There was only one maternal death and this occurred in a patient with severe pre-eclampsia with fetal macrosomia, post caesarean section. A post mortem examination was not done for her.

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