

Anaesthetic and Obstetric challenges of morbid obesity in caesarean deliveries-a study in South-eastern Nigeria

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Abstract

Background: Morbid obesity of parturient has become very important in perinatal medicine because of a worldwide obesity epidemic. Morbid obesity of parturient is reportedly associated with severely increased anaesthetic and obstetric risk.

Objective: To determine the prevalence rate, anaesthetic and obstetric complications in morbidly obese parturient that had caesarean delivery in a Nigerian tertiary care centre.

Methods: The obstetric theatre records and case files were reviewed for caesarean deliveries in the University of Nigeria Teaching Hospital, Enugu, Nigeria from May 2008 to December 2010. A sample size of 250 patients, calculated based on a prevalence rate of 19%, confidence interval of 95%, a power of 80% and a finite population of zero was used to determine the prevalence rate of morbid obesity (Body Mass Index of greater than or equal to 35kg/m²).

Results: There were thirty-one patients with morbid obesity (12.4%). The average Body Mass Index (BMI) was 38.3kg/m² (SD ± 2.99). Other findings included macrosomia (7 or 25.8%), gestational diabetes (13%) and pregnancy induced hypertension (7 or 22.5%). There were two neonatal deaths but no maternal deaths.

Conclusion: The prevalence rate of morbid obesity is about 10% in Nigerian women of child bearing age. This mirrors a World Health Organisation report published in the World Health Organisation Global Information Base.

Keywords: anaesthetic, obstetric, morbid obesity.

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Introduction

Morbid obesity of parturients reportedly occurs in about 1% of perinatal medicine¹. It is gaining importance because of a rising trend in juvenile obesity especially in the developed world.¹ The definition of morbid obesity has variously been put at a Body Mass Index (BMI) of greater than 35kg/m².^{2, 3} This definition corresponds to the World Health organization (WHO) classification of severe obesity or class II obesity (class three being BMI > 40kg/m²).⁴

The WHO classification of obese class II associates it with severely increased anaesthetic and obstetric risk⁵. There are very few studies on the anaesthetic

management of morbidly obese parturients in West Africa⁶ and we know of none that deals with the prevalence in the caesarean section population where the obstetrician and anaesthetists have to contend with the challenges involved.

Two studies from the United States of America (USA)⁷ and the United Kingdom⁸ gave prevalence rates in the caesarean section population of 40% and 19% of morbidly obese patients using the definition of BMI > 35kg/m² for morbid obesity.

World health organization (WHO) studies among Nigerian females (aged 15-49 years) showed an obesity prevalence rate (BMI > 30kg/m²) of 5.8% (9.6% for urban women) excluding pregnant women and women in the puerperal period⁹. At a BMI of > 25kg/m², the prevalence rate of overweight Nigerian women is 20% (27.7% for urban women)⁹.

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While there has been a commendable study on the anaesthetic management in the obese and non-obese caesarean section population in Nigeria¹⁰; the prevalence rate was not noted. This report seeks to examine the prevalence rate, complications and anaesthetic management in morbidly obese parturients that had caesarean delivery in the University of Nigeria Teaching Hospital (UNTH), Enugu, Nigeria.

Methods

The study design was an observational retrospective study. The obstetric theatre records and case files were retrospectively reviewed for caesarean deliveries in our centre from May 2008 to December 2010. A sample size of 250 patients, calculated based on an obesity prevalence rate of 19%⁸, confidence interval of 95%, a power of 80% and a finite population of zero (the population that gives the largest sample size for the prevalence rate and confidence interval) was used to determine the prevalence rate of morbid obesity BMI $\geq 35\text{kg/m}^2$ amongst pregnant women that had a caesarean section.

The patients' demographics, height, weight, and BMI were collected. Also collected was the estimated blood loss (EBL), incidence of postdural headache, and feto – maternal morbidity. The patients received premedication with H₂ receptor antagonists, gastric prokinetic agents (prescribed by the anaesthetists), and in selected cases, low molecular weight heparin (prescribed by the obstetricians or physicians). The available Quincke sizes 23 and 25 needles were used for the subarachnoid block. Quincke needles size 27 and above were not available during the study period. General anaesthesia was achieved with rapid sequence intubation with the relaxant technique. Laryngeal mask airways (LMA) were available for use in case of failed intubation and rapid desaturation.

Patients that had either the body weight or height not recorded were excluded from the study. Weight used in this study was the last one taken before caesarean delivery.

Results

There were thirty-one patients with a BMI $\geq 35\text{kg/m}^2$ (12.4%) and six patients (2.4%) with a BMI $\geq 40\text{kg/m}^2$. The mean age of the patients was 33.3 years. The average BMI was 38.3kg/m^2 (SD ± 2.99). Twenty-seven patients received subarachnoid block and four delivered under general anaesthesia

(including two failed spinals that were converted to general anaesthesia). The mean estimated blood loss was 781.6mls (SD $\pm 349\text{mls}$) and the incidence of postdural puncture headache was (2/27 or 7.4%). All patients were at term except three patients who delivered at 30, 34 and 36 weeks respectively.

Other results obtained were as follows; macrosomia (8 or 25.8%), gestational diabetes (12.9%), and pregnancy induced hypertension (7 or 22.5%). There were three cases (9.6%) of postoperative nausea and vomiting (PONV). There were two neonatal deaths but no maternal deaths.

Table 1: Indications for caesarean section

Indication for caesarean delivery	Number (n=31)
Previous caesarean section with big baby	9
Postdatism + previous caesarean section	5
Fetal distress	3
Moderate to severe pregnancy induced	3
Hypertension	3
Prolonged labour	3
Malpresentation	3
Bad obstetric history	1
Uterine fibroid (obstruct. lower uterine segment) in pregnancy	1
Placenta praevia	1
Gestational diabetes/Macrosomia	1
Multiple pregnancy	1

Discussion

Thirty-one (12.5% of the study population) morbidly obese women had a caesarean delivery in this study. Our calculation of a Nigerian study with a sample population of 300 gave a prevalence rate of 17%¹⁰.

A study from the state of North Carolina in the United States of America (U.S.A)⁷ revealed that 40% of the patients that had caesarean delivery in their hospital were morbidly obese ($>35\text{kg/m}^2$), with a 52.8% obesity rate and 7.2% non-obesity rate. The 12.5% morbid obesity rate in this study is also lower than the 19% morbid obesity rate in the study by Bamgbade et al⁸ in the United Kingdom.

Obesity depends on socio-demographic factors, and the WHO data base on the prevalence of obesity in women in South Eastern Nigeria where this study took place gave a figure of 8.4% for both urban and rural women⁹ (pregnant or lactating mothers were excluded). Almost 40% of women in the region had a BMI of $> 25\text{kg/m}^2$ ⁹.

The increased risk factors including comorbidities in this study are in tandem with findings from other studies, including hypertension and cardiovascular diseases, and type 2 diabetes^{4,7,8,10,11,12}. Obstetric risks include the following: in the presence of obesity, a clinical diagnosis of pregnancy is sometimes difficult to make. As the pregnancy proceeds, it may be difficult to evaluate the size of the fetus, determine the presenting fetal part, detect the fetal heart, or recognize the presence or absence of polyhydramnios¹³. Cephalopelvic relationships are difficult to estimate, with any clinical accuracy, when patients are fat. The potential risk of cephalopelvic disproportion is always present, particularly as multiparity and the increased lordosis caused by obesity are both predeterminants of spondylolisthesis.

If Caesarean section is necessary, and there is a natural hesitancy to operate on obese patients, the hazards of both surgery and anaesthesia are increased. Depending on the site of the abdominal wound, there may be delayed healing due to haematoma formation and sweating, apart from intraoperative challenges like haemorrhage and achievement of haemostasis. During the puerperium, there is an increased risk of deep vein thrombosis¹³.

Twenty-seven morbidly obese patients in this study delivered under spinal anaesthesia using the available Quincke sizes 23 and 25 needles and four parturients delivered under general anaesthesia (including two failed spinals that were converted to general anaesthesia). The incidence of postdural puncture headache (PDPH) at 7.4% after spinal anaesthesia in this group is actually lower than that in the non-obese spinal anaesthesia population, estimated at 25% and 40% with the 25G and 22G cutting needles respectively¹⁴⁻¹⁷. This is significant as more attempts may have been made to achieve successful dural puncture in this study.

The decreased incidence of PDPH in morbidly obese parturients may relate to the large abdominal panniculus that functions as the equivalent of an abdominal binder, elevating intraabdominal pressures and retarding the degree of spinal fluid leakage through the dural puncture site¹⁸. However, because of the technical difficulties involved in achieving successful subarachnoid block in morbidly obese patients, it is best undertaken by experienced anaesthetists who are also proficient in endotracheal intubation, should spinal anaesthesia fail.

Major challenges in regional anaesthesia for obese pregnant women include the identification of

appropriate landmarks, adequate patient positioning prior to and after performing the block, choosing a needle of sufficient length and the appropriate dose of local anaesthetic¹⁹. It has been recommended that doses of local anaesthetics should be reduced by 25% for subarachnoid and epidural blocks in morbidly obese patients²⁰. The lower prevalence of obesity in Nigeria might not be a surprise as the local cuisines are lower in fat and calorie content. It is also known that West Africans gain more weight when they relocate to the Western world²¹.

The prevalence rate in this paper mirrors the WHO report⁹ in that while overweight women are almost a third of our population, obese and morbidly obese women may be a significant minority in South-eastern Nigeria.

Use of spinal anaesthesia in morbidly obese patients minimised the risk of failed or difficult intubation with its consequences, and was largely responsible for the good outcome in this high risk group. The surprising absence of stillbirths may be related to higher socio-economic status of the patients and good referrals. It has been reported that the poor in the developed and the affluent in the developing countries are the predominately obese population²².

Spinal anaesthesia is advised for use in our environment not just because of cost effectiveness, but because the incidence of post-dural headache may be reduced in obese patients^{16,17}. The number of attempts before successful subarachnoid injection of bupivacaine was not documented, and was one limitation in this study. Another limitation was the retrospective nature of the study. Use of the more expensive With acre needles might result in even lower rates of PDPH.

Conclusion

The prevalence rate in this study mirrors a World Health Organisation report that morbidly obese women are about 10% of Nigerian women of child bearing age. The increased risk factors, including comorbidities in this study, are in tandem with findings from other studies. Use of spinal anaesthesia in these morbidly obese patients minimised the risk associated with general anaesthesia and was largely responsible for the good outcome in this high risk group.

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