Journal of Medicine and Medical Sciences Vol. 2(10) pp. 1152-1156, October 2011
Available online@ http://www.interesjournals.org/JMMS


*Full Length Research Paper*

# Pregnancy outcome among obese paturients at the University of Port Harcourt Teaching Hospital, Nigeria

**Jeremiah Israel*, Nyeche Solomon*, Akani Chris*, Akani Nwadiuto****

*Department of Obstetrics and Gynaecology, **Department of Paediatrics, University of Port Harcourt Teaching Hospital, Port Harcourt, Nigeria.

Accepted 06 October, 2011

**There is concern for very obese women and their pregnancy outcomes as obesity confers increased risk of maternal and perinatal complications. This study aims to determine the prevalence of obesity in pregnancy and the maternal and foetal risk of adverse pregnancy outcome in relation to maternal obesity. This prospective study was carried out at the University of Port Harcourt Teaching Hospital (UPTH) between May 2006 and April 2007. A cohort of 150 pregnant women with BMI ≥ 30kg/m$^2$ who registered for antenatal care were identified and compared with a control group of 150 non-obese pregnant women. The incidence of obesity in the study was 6.0%. More of the obese patients were of low parity. Sixty percent of the obese women had tertiary education. Preeclampsia (14%), malpresentations (5.3%) and prolonged pregnancy (24%) were significantly more common in the obese group. The Caesarean section rate was also higher in the obese group (p<0.001). Foetal macrosomia and birth asphyxia were significantly higher among the obese group (p=0.001). Pregnancy in obese women presents a certain amount of risk and there is need for close surveillance to reduce these obesity-related complications in pregnancy.**

**Keywords:** Obesity, Pregnancy, Perinatal outcome, Maternal complications.

## INTRODUCTION

Obesity is a nutritional disorder characterised by an excessive accumulation of fat in the subcutaneous tissues, in the omentum and viscera, and in muscles. In women, the fat component of body weight has a normal range of 18-24% (Klufio, 2002). Obesity is present in a woman where more than 25% of body weight is fat.

The World Health Organization has projected that more than 700 million adults will be obese by 2015 (WHO 2011). Many low-income countries are affected by rising levels of obesity. Nigeria is Africa's most populous country and its economy is growing rapidly with urbanization, industrialization, and changes in lifestyle—all of which predispose to obesity and other health-related conditions associated with it. These factors are probably more operative in Port Harcourt than in other cities in Nigeria considering her increasing prominence and rapid urbanization as Nigeria's crude oil operations expand. Despite this, the overall prevalence of overweight adults in Nigeria is low and that of undernutrition is high, with obesity most common among women in urban and high-socioeconomic-status groups (National Population Commission, 2009).

The increasing prevalence of obesity worldwide has prompted WHO to designate obesity as one of the most important global health threats (WHO 2000). The epidemic is especially pronounced in young people; in Nigeria, 22% of women aged 25-49 years are overweight or obese (National Population Commission, 2009). Olayemi et al (2002), in University College Hospital Ibadan reported an incidence of 7.4% whereas an incidence of 7.7% was reported by Obi et al. (2004) at Abakaliki. An increased association of morbidity and mortality with obesity is well established in both pregnant and non-pregnant women (Klufio, 2002; Despres et al., 2001). Large population-based epidemiological studies indicate that high pre-pregnancy weight or BMI confers increased risk of maternal and perinatal complications, including pre-eclampsia, gestational diabetes, Caesarean delivery, foetal macrosomia, stillbirth, prolonged labour, increased blood loss, wound infection and neonatal

*Corresponding author E-mail: jerryoms@yahoo.com

**Table 1.** Demographic characteristics and obstetric history

| | Obese (N1) (BMI≥30kg/M$^2$) | Percentage (%) | Non-Obese (N2) (BMI<30kg/M$^2$) | Percentage (%) |
|---|---|---|---|---|
| **Maternal Age (Years)** | | | | |
| 20 | 0 | 0 | 1 | 0.6 |
| 20-24 | 5 | 3.3 | 23 | 15.3 |
| 25-29 | 62 | 41.3 | 70 | 46.6 |
| 30-34 | 68 | 45.3 | 43 | 28.6 |
| 35-39 | 13 | 8.6 | 10 | 6.6 |
| ≥40 | 2 | 1.3 | 3 | 2 |
| **Parity** | | | | |
| 0 | 62 | 41.3 | 79 | 52.6 |
| 1-2 | 65 | 43.3 | 49 | 32.6 |
| 3-4 | 20 | 13.3 | 18 | 12 |
| ≥5 | 3 | 2 | 4 | 2.6 |
| **Educational Status** | | | | |
| None | 1 | 0.6 | 0 | 0 |
| Primary | 4 | 2.6 | 3 | 2 |
| Secondary | 49 | 32.6 | 50 | 33.3 |
| Tertiary | 96 | 64 | 97 | 64.6 |

admissions (Oken et al., 2007; Fraser, 2006; Rosenberg et al., 2003, Ruager-Martin et al., 2010).

Understanding the relationship between maternal obesity and pregnancy outcomes is necessary in order to develop programmes of preconception planning and weight control. This issue is of increasing clinical and public health importance as the proportion of women who are overweight and obese is rapidly increasing.

Although there are several published reports from Nigeria on obesity in both adolescents and the general population, none exists on the prevalence of maternal obesity and risk of adverse perinatal outcome in Port Harcourt. This study therefore sought to determine the prevalence of obesity in our antenatal population and identify the relationship between maternal obesity and pregnancy outcome among these women.

## MATERIALS AND METHODS

This prospective study was carried out in the University of Port Harcourt Teaching Hospital, Port Harcourt in Rivers State, South-South Nigeria between May 2006 and April 2007. The subjects consisted of 150 pregnant women who registered for antenatal care with a body mass index (BMI) ≥ 30kg/m$^2$ at booking. Information was collected on their socio demographic characteristics, antenatal attendance, various pregnancy outcomes including mode of delivery, foetal weight, perinatal and maternal complications. These were compared with 150 non-obese (BMI<30kg/m$^2$) pregnant women used as controls. Both groups were followed up until delivery and various maternal and perinatal variables were compared between the two groups.

Clients with pre existing diabetes mellitus or hypertension were excluded from this study.

Data collected was entered into a spread sheet using SPSS 15.0 for Windows® statistical software which was also used for analysis. Results are presented as means with standard deviations, rates and proportions in tables and figures. Students'-t tests and the chi-square tests were carried out where necessary. A p value of $< 0.05$ was accepted as statistically significant.

## RESULTS

During the study period, a total of 4,832 women registered for antenatal care. Of these, 357 were identified as obese giving a prevalence of 7.4%.

Table 1 showed the socio demographic characteristics of the obese and non-obese mothers. Of the obese mothers, 45.3% were in an age range 30-34 years and primiparous women accounted for majority (84.7%) of them. Less than 1% had no formal education while 2.7%, 32.7%and 64% had primary, secondary and tertiary education respectively.

Table 2 shows the maternal outcome between the two groups studied. The obese pregnant women were significantly more likely to have hypertensive disorders of pregnancy (14% vs. 6%, $p<0.001$). Three women (2%) from the obese group had gestational diabetes mellitus while none from the control group became diabetic. The incidence of malpresentations at term were also significantly higher in the study group than the control group (5.3% vs. 2%, $p<0.001$). Prolonged pregnancies were commoner among the study group (24% vs. 14%, $p < 0.08$). Obese parturients had a significantly higher

**Table 2.** Maternal outcome

| Parameters | Obese (N=150) (BMI≥30kg/M$^2$) | | Non-Obese (N=150) (BMI≥30kg/M$^2$) | |
|---|---|---|---|---|
| | No. | Percentage (%) | No. | Percentage (%) |
| **1. Antenatal Complication** | | | | |
| Preeclampsia | 21 | 14 | 9 | 6 |
| Diabetes In Pregnancy | 3 | 2 | 0 | 0 |
| Aph | 2 | 1.3 | 0 | 0 |
| Anaemia | 0 | 0 | 1 | 0.6 |
| Malaria | 2 | 1.3 | 3 | 2 |
| Uti | 0 | 0 | 1 | 0.6 |
| Scd | 0 | 0 | 1 | 0.6 |
| Mal Presentation | 8 | 5.3 | 3 | 2 |
| Twiin Gestation | 2 | 1.3 | 3 | 2 |
| Pre Term Delivery | 23 | 15.3 | 36 | 24 |
| Post-Datism | 36 | 24 | 21 | 14 |
| Rvd | 2 | 1.3 | 1 | 0.6 |
| **2.Labour Complications** | | | | |
| ●Vaginal Delivery | | | | |
| (I)Svd | 100 | 66.7 | 127 | 84.6 |
| (Ii)Ovd | 5 | 3.3 | 1 | 0.6 |
| ●Caesarean Section | 45 | 30 | 22 | 14.6 |
| ●Genital Laceration/Episiotomies | 16 | 10.6 | 11 | 7.3 |
| **3. Pueperal Complecation** | | | | |
| Primary PPH | 5 | 3.3 | 4 | 2.6 |
| Wound Infection | 6 | 4 | 3 | 2 |
| Maternal Mortality | 1 | 0.6 | 1 | 0.6 |

KEY:
SCD = Sickle cell disease
APH = Antepartum haemorrhage
SVD = Spontaneous vertex delivery
UTI = Urinary tract infection
RVD = Retroviral disease
PPH = Postpartum haemorrhage
OVD = Operative vaginal delivery

**Table 3.** Fetal Outcome

| | Obese (N=150) (BMI≥30kg/M$^2$) | | Non-Obese (N=150) (BMI≥30kg/M$^2$) | |
|---|---|---|---|---|
| | No. | Percentage(%) | No. | Percentage(%) |
| Macrosomia (Birth Wt≥4kg) | 33 | 22 | 14 | 9.3 |
| Iufd | 1 | 0.6 | 2 | 1.3 |
| Birth Asphyxia (1 Min Apgar) | 10 | 6.6 | 5 | 3.3 |
| Birth Trauma | 4 | 2.6 | 1 | 1.3 |
| Congenital Abnormality | 2 | 1.3 | 0 | 0 |
| Admission To Scbu | 14 | 9.3 | 6 | 4 |
| Perinatal Mortality | 5 | 3.3 | 2 | 1.3 |

KEY:
IUFD = Intrauterine foetal death.

Caesarean section rate (30% vs. 14.7%, p<0.001). Table 3 shows a comparison of the foetal outcome between the two groups. The incidence of foetal macrosomia was significantly higher among the obese subjects (22% vs. 9.3%, p<0.001). The obese pregnant women were at higher risk of adverse perinatal outcome. Birth asphyxia was significantly higher among the obese group (6.6% vs. 3.3%; p=0.001). There was a higher rate of admissions into the neonatal intensive care unit among the obese group (9.3%) than the non-obese group (4%). Perinatal mortality was also commoner among the obese group (3.3%) than the control group (1.3%).

## DISCUSSION

The prevalence of obesity in this study was 7.4%. This is higher than the National figure of 6% (National Population Commission, 2009) but similar to the 7.4% and 7.7% recorded in Ibadan and Abakiliki respectively (Olayemi et al., 2002; Obi et al., 2004). Majority of the obese women were primiparous and had tertiary education. This is in keeping with findings from the National demographic and Health Survey which found obesity to be commoner in southern Nigeria where there is a higher level of education and wealth (National Population Commission, 2009).

In this study we found that obesity was significantly associated with an increased risk for gestational diabetes mellitus. This finding is well established and has been well documented by several authors (Society of Obstetricians and Gynaecologists of Canada, 2010).

The obese group showed a significantly high tendency for hypertensive disorders, malpresentation, prolonged pregnancy and above all multiple fold risk for abdominal delivery as had been reported by other workers (Obi et al., 2004; Fraser, 2006). Foetal birth weight was significantly higher in the obese group compared to the non-obese group. Other studies (Kumari 2001; Bianco et al., 1998) have demonstrated that obese women are more likely to deliver large for gestational age neonates. This could be explained by the high frequency of gestational diabetes among the obese women and may be associated with the poor glycaemic control.

The Caesarean section rate in this study was significantly higher in the obese group. This may be due to the presence of a combination of factors like inadequately controlled diabetes, hypertension, macrosomia, malpresentations and failure of induction of labour. This finding is consistent with many previous reports (Bhattacharya et al., 2007; Leung et al., 2008). However, it is at variance with the study of Parlow et al., (1992) who reported that obesity per se was not associated with higher Caesarian section rates. The obese group constituted a very unique problem entity in terms of, wound infection, poor episiotomy healing and prolonged hospital stay.

Adverse perinatal outcome such as birth asphyxia, birth trauma, neonatal hypoglycaemia, higher admission rate in the special care baby unit were higher in the obese group. This may be the direct consequence of complications of obesity such as gestational diabetes, hypertension and foetal macrosomia. These findings are similar to reports from other authors (Kumari 2001; Bianco et al., 1998). It thus appears that obesity is an independent risk factor for adverse perinatal outcome. Prenatal counseling of obese women regarding weight reduction and healthy food habits seems vital.

Obstetric performance and outcome of obese women remain a very serious source of concern in our maternity services (Olayemi et al., 2002; Okpere,2003). This study shows there is a need for improved surveillance and higher level care for obese patients as both the women and their babies are at higher risks for adverse pregnancy outcome than the general population. There is also a high need for education of the general obstetric population on prenatal weight control. Paucity of research underestimates the consequence for obstetric practice and health plans because of co-morbidities and increasing clinical demands. They may become regular features in our obstetric population.

## CONCLUSION

The prevalence of obesity in this study was 7.4% and these women and their babies were at a higher risk for adverse pregnancy outcome than the non-obese parturients. Thus, there is need for closer surveillance to reduce these obesity related complications in pregnancy through multi-disciplinary management involving the obstetrician, physician, neonatologist, dietician and the social health worker.

### REFERENCES


Bhattacharya S, Campbell DM, Liston WA, Bhattacharya S (2007). Effect of body mass index on pregnancy outcomes in nulliparous women delivering singleton babies. BMC
Public Health;7:168.

Bianco AT, Smilen SW, Davis Y, Lopez S, Lapinski R, Lockwood CJ (1998). Pregnancy outcome and weight gain recommendations for the morbidly obese woman. Obstet. Gynecol. ;91:97-102.

Brockelsby J, Dresner M (2006). Obesity and pregnancy. Current Anaesthesia and critical care. 17: 125-129.

Despres. JP, Lemieux I, Prud'homme D (2001). Treatment of obesity; need to focus on high risk abdominally obese patients. Br. Med. J. 322: 716-720.

Flegal KM, Carroll MD, Ogden CL, Johnson CL (2002). Prevalence and trends in obesity among US adults 1999-2000. JAMA. 288: 1723-1727.

Fraser RB (2006). Obesity complicating Pregnancy. Current Obstetrics and Gynaecol. 16: 295-298.

Klufio CA (2002). Obesity in pregnancy. In: Kwakwukume E.Y and Emuveyan E.E. (Eds.) Comprehensive Obstetrics in the tropics. 1st Edition. Asante and Hittsher printing press limited, Dansoman, Ghana. Pp. 219-225.

Kumari AS (2001). Pregnancy outcome in women with morbid obesity. Int. J. Gynecol. Obstetrics. 73: 101-107.

Leung TY, Leung TN, Sahota DS, Chan OK, Chan LW, Fung TY, Lau TK (2008). Trends in maternal obesity and associated risks of adverse pregnancy outcomes in a population of Chinese women. BJOG 115(12):1529–37.

National Population Commission (NPC) [Nigeria] and ICF Macro (2009). Nigeria Demographic and Health Survey 2008. Abuja, Nigeria: National Population Commission and ICF Macro.

Njoku CH (2006). Obesity measurement and management: a review. Nig. Med. Practitioner. 49:144-147.

Obi SN, Obute EA (2004). Pregnancy outcome in obese Nigerians. Trop. J. Obstet. Gynaecol. 21:32-35.

Oken E, Taveras EM, Kleiman KP, Rich-Edwards JW, Gillman MW (2007). Gestational weight gain and child adiposity at age 3years. Am. J. Obstet. Gynaecol. 196: 322 – 328.

Okpere EE (2003). Obesity in pregnancy. In: Okpere EE. (Ed.) Clinical obstetrics. 1st Edition. UNIBEN PRESS, Benin City. pp. 122-128.

Olayemi OO, Umuerri CO, Aimakhu CO (2002). Obstetric performance of Nigeria obese parturients. Trop. J. Obstet. Gynaecol. 19:17-20.
Perlow JH, Morgan MA, Montgomery D, Towers CV, Porto M (1992). Perinatal outcome in pregnancy complicated by massive obesity. Am. J. Obstet. Gynecol. 167: 958-962
Ruager-Martin R, Hyde MJ, Neena Modi N (2010). Maternal obesity and infant outcomes. Early Human Development. 86: 715–722
Rosenberg TJ, Garbers S, Chavkin W, Chiasson MA (2003). Pregnancy weight and adverse perinatal outcomes in an ethnically diverse population. Obstet. Gynaecol. 102(5.1): 1022-1027.
Society of Obstetricians and Gynaecologists of Canada CLINICAL PRACTICE GUIDELINES No. 239, February (2010). Obesity in Pregnancy. International Journal of Gynecology and Obstetrics. 110: 167–173
World Health Organization (2000). Obesity: preventing and managing the global epidemic. Report of WHO Consultation. World Health Organ. Geneva. Ted. Rep. Ser. 894:1-253.
World Health Organization (2011). Obesity and overweight. Fact sheet 311.
www.who.int.www.who.int/mediacentre/factsheets/fs311/en/index.html. Published 2006.
Updated 2011.