

MATERNO-FŒTAL OUTCOME OF LABOUR IN OBESE WOMEN IN YAOUNDE, CAMEROON.NANA P.N.¹; WANDJI J.C.²; FOMULU J.N.³; MBU R.E.¹; TONYE R.⁴; AKO S.N.⁴; LEKE R.J.I.¹(Manuscript N° E106. Received 12/05/2008. Accepted in revised form 27/02/2009) **Clin Mother Child Health 2009; Vol 6, N° 1:989-993****ABSTRACT:**

Overweight, obesity or morbid obesity has been shown to have a deleterious effect on the mother and the foetus. Among the various complications are macrosomic babies, increased caesarean section rate, postpartum haemorrhage, foetal distress and foetal death. The objectives of the study were to determine the socio-demographic characteristics of pregnant women with obesity and morbid obesity determine the mean birth weight, foetal length and Apgar score of the babies as well as associated maternal complications. This was a descriptive cross sectional prospective study carried out between the 1st of January and the 31st July 2006. Recruitment was carried out in the maternity service of the main teaching hospitals in Yaoundé. All pregnant women in labour or in the immediate postpartum with body mass index greater or equal to 30 were fit for the study. About half of the women were married (46.5%), multi-parous (49%), attained the level of secondary education (59.3%). Most of the women were of low socio-economic status (82%) with the male partners slightly more financially fit than the women (57.1%). The 25-29 years age group was most represented (32.6%), with the morbid obesity being preponderant (90.8%). Maternal complications were seen in 64% of the patients. The complications were more frequent in the morbid obesity than in the obesity group. Only uterine atony and placenta retention were seen in the obesity group. Placenta retention and caesarean section (20.5%) was commoner in the morbid obesity group. Stillbirths, small-for-dates, poor Apgar score and foetal macrosomia were reported in the morbid obesity group. The babies were longer and weighed more with means of 51.3 cm and 3348 g respectively. Obesity and morbid obesity constitute a high risk factor in pregnancy. Pregnancy in these women must therefore be monitored closely in the ante-partum, intra-partum and immediate post-partum periods. Early detection of complications and treatment is paramount if we have to improve on the materno-foetal morbidity and mortality among obese pregnant women.

KEY WORDS: Obesity - Morbid obesity - Materno-foetal morbidity and mortality.**DEVENIR MATERNO-FŒTAL DU TRAVAIL CHEZ LES FEMMES OBESES A YAOUNDE, CAMEROUN.****RESUME:**

L'obésité, l'hyper-obésité et pourquoi pas les sous poids constitutionnel ou acquis peuvent prédisposer à la morbi-mortalité materno-fœtale. Le surpoids, l'obésité et l'hyper-obésité prédisposent à la naissance des gros fœtus et à des macrosomies, augmentant les risques de césarienne, d'hémorragie du post-partum et de décès intrapartal. Notre étude avait pour objectif de : déterminer les caractéristiques socio-démographiques, l'index de masse corporelle de base des femmes et la morbi-mortalité foeto-maternelle associée à une obésité ou hyperobésité. Cette étude a été descriptive transversale menée du 1^{er} Janvier 2006 au 31 Juillet 2006. Les maternités des hôpitaux universitaires de Yaounde ont été le lieu de l'étude ; les femmes enceintes ayant un IMC supérieur ou égal à 30 étaient incluses dans l'étude. Près de la moitié des femmes étaient mariées (46,5%) et multipares (49%) avec un niveau d'étude secondaire (59,3%). La plupart des femmes étaient de la classe socio-économique basse (82%), avec des partenaires financièrement plus nantis qu'elles (57,1%). La tranche d'âge de 25-29 ans était la plus représentée (32,6%) avec une prédominance des hyperobèses (90,8%). Une complication maternelle a été notée chez 64% des patientes. Les complications étaient plus fréquentes dans le groupe des hyperobèses que dans le groupe des obèses. Seulement l'atonie et la rétention placentaire ont été notées dans le groupe des obèses. La rétention placentaire et la césarienne (20,5%) étaient plus fréquentes chez les hyperobèses. Les mort-nés, les petits poids à la naissance, le mauvais score d'Apgar et la macrosomie fœtale ont été retrouvés chez les femmes hyperobèses comme responsable de la morbi-mortalité fœtale. Les foetus étaient aussi grand de taille et de poids par rapport aux références de la littérature avec respectivement des moyennes de 51,3 cm et de 3348 grammes. Les femmes obèses et hyperobèses constituent un groupe à haut risque dont la grossesse doit être rigoureusement suivie en antepartum, intrapartum et post-partum immédiat. Le risque réel de développement de diabète, d'hypertension artérielle gravidique, de macrosomie fœtale et de la morbi-mortalité qui y est associé.

MOTS CLES: Obèse - Hyper obèse - Morbidité et Mortalité materno-fœtale.

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I- INTRODUCTION

Obesity, morbid obesity and why not constitutional or acquired underweight may predispose to materno-foetal morbidity and mortality [1]. However, an improved nutritional status of the mother before conception has been shown to reduce the adverse maternal and foetal outcome [2, 3]. Obese and morbid obese women may become pregnant or weight gain may be excessive in pregnancy. However, a harmonious weight gain in pregnancy carries little or no major complication. An abnormal weight gain or pathological weight gain occurs when the weight suddenly moves out of the weight gain curve [4]. This is usually associated with complications such glucose intolerance and pre-eclampsia / eclampsia.

Among the several factors that determine an uneventful progress of pregnancy and delivery are the equilibrium between food intake and the basic needs of the organism. Overweight, obesity and morbid obesity predispose to overweight and / macrosomic babies, increased risk of operative deliveries and postpartum haemorrhage [5]. Intrapartum death from prolonged labour and foetal distress are also commonly associated with over weight and obesity [5]. Though few studies have been carried out on the topic in our environment, the knowledge of the critical and morbid body mass index for the foetus and the mother will constitute a solid base for materno-foetal morbidity and mortality risk evaluation. Based on the above observations we decided to carry out a study on the materno-foetal outcome in obese women in Yaounde with the hypotheses that a body mass index of 30 and above in a pregnant woman at term is a high risk factor for materno-foetal complications.

The specific objectives of the study were to:

- Determine the socio-demographic characteristics of the obese pregnant women.
- Determine maternal morbidity and mortality associated with obesity/ morbid obesity.
- Determine foetal morbidity and mortality associated with obesity/ morbid obesity.

II- MATERIALS AND METHODS

This was a descriptive cross sectional prospective study carried out between the 1st January and 31st July 2006. The maternity service in the four main teaching hospitals of Yaounde: (Central Maternity, General hospital, Gynaeco-Obstetric and Paediatric hospital, University Teaching hospital).

Sample population: All pregnant women with body mass index (BMI) greater or equal to 30 were recruited into

the study. The body mass index was calculated using the formula weight in kilogram divided by the height in metres squared (WT/ HT²). The weight and height of the women were measured on admission before term delivery or in the early postpartum. The women were examined for intrapartum and postpartum complications.

Women who qualified for the study but refused to participate or those lost to follow up and those discharged before the completion of the study were excluded.

Data collection: A pre-tested questionnaire was used to collect the data. Information was obtained from the hospital booklet of the patients, the registers of the delivery room, the theatre, admission ward and finally the women. The questionnaire contained information on the socio-demographic characteristics of the mother, the gestational age, mode of delivery, Apgar score, foetal length and foetal weights.

Data analysis: This was done using SPSS (statistical package for social sciences), Epi-info 4.0. A statistically significant difference was reported when p was less than 0.05.

III- RESULTS

Five hundred women were recruited during the period of study. Forty six (9.2%) of them had body mass index between 30 and 40 (obesity), while 454 (90.8%) had body mass index of greater or equal to 40 (morbid obesity).

Table I- Socio-demographic characteristics amongst the two groups.

Variable	BMI	BMI	Total	%
	[30-40]	[40]		
Primipara	26	154	180	36
Multiparae	18	227	245	49
Grandmultiparae	2	73	75	15
Marital status:				
Single	24	237	261	52.2
Married	22	217	239	46.5
Housewife	24	237	261	52.2
Employed	21	211	232	46.5
Student	1	6	7	1.4
Illiterate	1	16	17	3.5
Primary education	5	48	52	10.5
Secondary education	27	269	296	59.3
Higher education	12	121	133	26.7

Women with morbid obesity were most represented in the study. There was an even distribution of single and married mothers. The level of education in the study

population was very high, 86% of the women had attended a secondary school. Pregnancy among school girls was reported in 1.4% of the women. 33.9% of women had morbid obesity in their first pregnancy while 56.5% were obese in their first pregnancy.

Table II- Age group distribution and body mass index (BMI) in the two groups.

Age Group (Years)	Number		Body Mass Index		Total %	
	[30-40]		[40]			
	%	Number	%	Number	%	Number
[15-20]	9	19.6	25	5.5	34	6.8
[20-25]	15	32.6	118	25.9	132	26.4
[25-30]	6	13.0	158	34.8	163	32.6
[30-35]	2	4.3	54	12.0	56	11.3
[35-40]	2	4.3	20	4.3	22	4.3
[40-45]	12	26.1	77	17.0	91	18.2
[45-50]	0	0.0	2	0.5	2	0.4
Total	46	100	454	100	500	100

The [25-30]years age group (59%) was most represented in the morbid obesity group, contrary to the obese group where the [20-25]years (32.6%) and [40-45]years (26.1%) age groups were most represented. BMI therefore seems to increase with age.

Table III- Parity and body mass index (BMI).

Parity	Body Mass Index (BMI)				Total %	
	[30-40]		[40]			
	Number	%	Number	%	Number	%
Primiparity	26	56.5	154	33.9	180	36
Multiparity	18	39.1	227	50	245	49
Grand-multiparity	2	4.3	73	11.1	75	15
Total	46	100	454	100	500	100

More primiparous women (56.5%) had body mass index in the [30-40]group. However, the multiparous and grandmultiparous women had body mass index in the [40] group. Body mass index therefore increases with parity.

Table IV- Body mass index and obstetrical complications.

BMI	Obstetrical complications	%	Absence of obstetrical complications	%	Total
[30-40]	30	65.2	16	34.8	46
[40]	292	64.3	162	35.7	454
Total	332	64.4	178	35.6	500

Of the 500 patients, 322 (64.4%) suffered at least one obstetrical complication.

Complications rates were similar in the obese and morbidly obese women (65.2% and 64.3%) respectively. The major complication observed in the obese group included uterine atony (55.6%) and placenta retention (44.4%). However, in the morbidly obese group, placenta retention was more frequent (49.5%). Other morbidities were uterine atony (26.5%), caesarean section (20.5%), and placenta accreta (1.7%).

Table V- Birth weight in the obese and morbidly obese group.

Body mass index	Birth weight					
	2500gms[]2500gms		Total	
	Number	%	Number	%	Number	%
[30-40]	4	10.9	42	89.1	46	100
[40]	35	7.6	419	92.4	454	100
Total	39	7.8	461	92.2	500	100

A stillbirth rate of 1.2% was reported in the study population.

The majority of the women (92.2%) had babies of normal weights (>2500 gms). Small-for-date babies (<2500g) were seen in 7.8% of the women. A slightly lower prevalence of small for date were seen in the morbidly obese group (7.6%) as against the obese group (10.9%).

Table VI- Foetal length in the obese and morbidly obese group.

BMI	Foetal Length					
	<50cm		>50cm		Total	
	Number	%	Number	%	Number	%
[30-40]	25	54.5	21	45.5	46	100
[40]	198	43.6	256	56.4	454	100
Total	223	44.6	227	55.4	500	100

The head to foot length of the babies was found to be greater than the mean length at birth of 50cm. The mean length was 51.3 and this was statistically significant with p<0.05

Though the foetal length on the average was greater than the usual reported mean of 50cm, the morbidly obese women had foetal length greater than 50cm in 56.4% of cases, contrary to 45.5% in the obese group. However, a greater proportion of the women (55.4%) had foetal length greater than 50cm.

Morbidly obese mothers carried greater foetal complications than the obese. The obese mothers had small for dates (10.9%), normal to macrosomic babies

(89.1%), while the babies of the morbidly obese mothers were normal to macrosomic in 92.2%. Though a slightly lower prevalence of small for date was reported in the morbidly obese group, the rate of stillbirth, the Apgar score, intra-partal death and postpartum deaths were more common in this group with rates of 8%, 3.7%, 25.5%, 6.4%, and 6.4% respectively. The difference was statistically significant with $p < 0.05$, showing that foetal complications were related to maternal weight or BMI.

Table VII- Body mass index, maternal and foetal complications.

BMI	Maternal complications		No maternal complications		Foetal complications		No foetal complications	
	Number	%	Number	%	Number	%	Number	%
[30-40[30	65.2	16	34.8	9	19.6	37	80.4
[40	292	64.3	162	35.7	305	67	149	33
Total	322	64.4	178	35.6	314	62.8	186	37.2

Morbid obesity carried a higher risk for both maternal and foetal complication in the ante partum, intrapartum and post-partum period (64.3% and 67%) as against (65.2% and 19.6%) in the obese group respectively. The obese women showed a slightly higher prevalence of complications (65.2%). However, complications were seen in about the same proportion in the mother and foetus when both groups were analysed (64.4% and 62.8%) respectively.

IV- DISCUSSION

The mean age in the study was 29 years. However, 65.8% of the patients were aged 30 years. NASAH et al, [6] reported the average age for multiparity to be 27.4 years in Cameroon. The level of education was high amongst the patients, 59.2% and 26.7% had attained secondary and higher education levels respectively. As reported by BOTEN [7], education of the girl child leads to late onset of procreation and may explain the higher number of women 30 years and above in the series. Adolescent pregnancy was reported in 6.8% of the women. The number of students in the study was low (1.4%) compared to the 21.01% reported by Boten [7]. Since only morbidly obese and obese women were included in the study, it is generally difficult to see obese school girls. Pregnancies amongst women 40 years and above were reported in 18.6% of the women. Weight gain has been shown to increase with age and parity. This tendency was observed in this study where advancing age, multiparity and grand multiparity were seen to be commoner among the morbidly obese. Generally the women were of a lower socio-economic

status. The quality of food eaten is influenced by the social class and may directly influence weight gain. The majority of the women was multiparous (49%) and married (52.2%). These values are similar to those reported by BOTEN [7] working in the same environment but differs slightly from those reported by NGASSA et al [8]. When other factors are controlled, multiparity increases birth weight by 80-120gms until the fifth pregnancy [7].

In all 322 (64.4%) women had complications in the obese and morbidly obese groups. The rate of complication was also similar in the two groups (65.2% and 64.3%) respectively. There was a variation in the type of complication observed. The obese women had uterine atony (55.6%) and placenta retention (44.4%) as the only complications, while in the morbidly obese patients' placenta retention occurred in 49.4% of the women. Uterine atony was reported in 26.5%, caesarean section 20.5% and placenta accreta 1.7% in the morbidly obese group. SEBIRE et al, [10] reported that induction of labour and delivery by caesarean section was twice as high for morbidly obese women than for women with normal BMI. Our caesarean section rate of 20.5% is similar to that of other authors but higher than the caesarean section rate among non-obese women for the central maternity of 11-12% [9- 10]. They also showed that the risk for postpartum haemorrhage rose with increasing BMI, and ranges from 30-70% for the moderate to the morbidly obese. Postpartum haemorrhage was reported in 55.6% and 26.5% in the obese and morbidly obese respectively in our study. Since one-fifth of the morbidly obese women delivered by caesarean section, active management of the third stage of labour and subsequent measures was taken to prevent uterine atony. There was no case of maternal death in the series.

A small-for-date (SFD) prevalence rate of 7.8% was observed in the study. However, more SFDs were seen in the obese (10.9%) than the morbidly obese women (7.6%). This finding is consistent with that reported by SEBIRE et al, [10] where obesity was associated with a reduced SFD rate. Obesity increases the risk of an abnormal glucose metabolism, the chances of gestational diabetes and consequently macrosomic babies. The mean head-foot length of 51.3cm in the study was greater than the usually reported mean of 50cm [5]. It was observed that 44.6% and 55.4% in the study group had head-foot length less than 50 and greater than 50 respectively. Babies of the morbidly obese women were taller than the obese (56.4% as against 45.5%). Foetal complications were more predominant in the morbidly obese group and consisted of foetal macrosomia (11%),

stillbirth (3.7%), poor Apgar score (25.5%), Intrapartum and early postpartum deaths (12.8%). Morbidly obese women carry a higher risk for both maternal and foetal complications in the ante partum, intrapartum and postpartum periods (91% and 97.1% respectively). Like SEBIRE et al, [10] we observed an increase in the foetal weight associated with increasing BMI as evident by the 8.7% and 11% foetal macrosomia rate reported in the obese and morbidly obese respectively. Foetal macrosomia is more common in the obese non-diabetic mother compared to the lean mother with gestational diabetes [10]. Obesity is associated with maternal insulin resistance and foetal hyperinsulinaemia even in the absence of maternal diabetes [11]. Insulin resistant individuals have higher fasting plasma triglyceride levels and greater leucine turnover [12-13]. Amino acids are insulin secretagogues and an increased flux of amino acids could stimulate foetal hyperinsulinaemia. Triglycerides are energy rich and placental lipases can cleave triglyceride and transfer free fatty acids to the foetus [14]. The combination of an increased energy flux to the foetus and foetal hyperinsulinaemia may explain the increased frequency of large for gestational age infants in the obese non-diabetic woman. A past history of diabetes was absent in all the women in this study.

V- CONCLUSION

The above study clearly identifies body mass index (BMI) as a major risk factor for poor obstetric outcome with consequences affecting the mother and the baby. The size of the foetus increases with an increasing BMI, thus an increase in the rate of obstructive labour, caesarean section, trauma to the genital tract, placenta retention, postpartum haemorrhage, foetal distress and foetal loss. Pre-pregnancy weight control, a weight gain that remains within the curve for weight gain in the particular woman is a pre-requisite to reducing materno-foetal morbidity and mortality related to excessive weight in pregnancy. BMI is therefore an indicator of body composition than weight alone, being a more sensitive indicator of obesity in shorter women, more predictive of gestational diabetes and no less predictive than weight alone for any other outcomes [15] ■

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