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THE IMPACT OF MATERNAL OBESITY ON PREGNANCY OUTCOME AT ASSIUT UNIVERSITY HOSPITAL

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ABSTRACT :

Obesity, an excess amount of body fat, frequently results in significant impairment of health including pregnancy outcome, the aim was to compare pregnancy outcome (Maternal+ Perinatal) between two groups of obese and non obese women. A prospective observational comparative study. Labor ward, Department of Obstetrics and Gynecology, Assiut University Hospital, Assiut. Women were recruited from those admitted to labor ward during a period of six months. Routine data; personal, obstetric, medical and surgical histories were collected. For the purpose of this study, obesity will be defined as Body mass index (BMI)≥30. A special sheet for data collection was designed. There was no statistical significance in terms of demographic characters in both groups. Obese women had more medical complications than non-obese women mainly: Diabetes mellitus, gestational or IDDM, chronic hypertension and placenta previa. There was as difference in CS rat between both groups. Perinatal outcome was similar in both groups with higher birth weights and more admissions to NICU for babies of obese mothers. Obesity seems to have a negative impact on pregnancy outcome; both maternal and perinatal. This issue should be addressed further in a larger study.

INTRODUCTION:

Obesity an excess amount of body fat, frequently results in significant impairment of health[1]. Overweight is defined as body mass index (BMI) equal or greater than 25 Kg/m² while obesity is defined as BMI equal or greater than 30Kg/m²[2]. There are approximately 300 million obese adults worldwide, while in Egypt 70% of adult women were overweight in 1998[3,4] added that the prevalence in 30.8% rural women and 49.1% urban women were obese.

Health problems of obesity are becoming serious in the present times. Obesity is more common in women than men and reports are showing increased risk of complication among pregnant women who are obese[5]. The prevalence of obesity is currently rising in developed countries, making pregravid overweight one the most common high -risk obstetric situations[6-9] Over weight and obesity are on the rise around the world about 300.000 deaths per day may be attributable to obesity. Many studies evaluated the correlation between body mass index and the out come of pregnancy and found that massive obesity can contribute to many complication during pregnancy[10,11] .

The pregravid overweight increases maternal and fetal morbidity[12,13]. Even

moderate overweight is a risk factors for gestational diabetes and hypertensive disorder of pregnancy, and the risk is higher in subjects with over related to a higher risk of cesarean deliveries and a higher incidence of anesthetic and postoperative complications in these deliveries[14-17]. Naeye[18] added that obese gravidaus woman have higher level hypertension, hyperglycemia, prolonged labor postamiatomy, post partum hemorrhage and puerperal pyrexia than to pregnant women who are not obese. More than one authors reported that a higher frequency of induction of labor in obese women than in normal weight women[19-21], whereas the duration of labor[11,22,23] and the percentage of instrumental deliveries [10,11,24,25] are usually similar. Complication during labor include cesarean section, dysfunction labor, cephalo pelvic disproportion, male presentation, shoulder distocia, fetal distress, fetal asphyxia at birth, macrosomia>4000 gr, apgar score<7 in fifth minute, neonatal intensive care unite and neonatal death[4]. Post partum complication such as postpartum thrombophlebitis, post-partum hemorrhage and urinary tract infection.

The nurse should inform overweight women of childbearing age of the risk s associated with pregnancy, receive appropriate dietary counseling and should screened for hypertension and carbohydrate intolerance and encourage to perform physical activity during follow up in the clinic and through home visits.

Aim of the Study:

-To determine the effect of maternal obesity on the pregnancy out come.

-To compare pregnancy outcome (Maternal and prenatal) between two groups of obese and non-obese in obstetric and gynecological department in Assiut university hospital.

SUBJECTS AND METHODS:

Setting:

The study was carried out at labor word of the Department of Obstetric and Gynecology, Assiut university hospital, Assiut.

Sample:

-Women attending the labor word of Obstetric and Gynecologic department during April 2001 to the end of Augusts 2001.

-All pregnant women who were admitted to the labor word of Obstetric and Gynecology of Assiut University Hospital were included

Selected woman for this study were 110 women (55 obese pregnant women had body mass index ≥30 and 55 non-obese pregnant women and had body mass index<30) from the first of April 2001 to the end of Augusts 2001). The target population for this study was pregnant obese women, A total of 110 pregnant women were conveniently selected to achieve the aim of the study.

Criteria for selection included normal pregnancy with no pathological conditions associated with it; both prime gravid and multi gravidae with different socio-economic levels were included.

Tools:

An interview questioner was designed and used to collect the relevant data

A-The socio demographic characteristic of the pregnant women are: age, parity, weight, height, body mass index (BMI) and gestational age.

B-Medical and obstetric history :

1-complication in previous pregnancy as diabetes mellitus, chronic hypertension,

previous abortion, previous still birth and previous neonatal / infant deaths.

2-Complication in the current pregnancy gestational diabetes (G.D), Twins premature rupture of membranes (PROM), placenta previa, placenta abruptio, post-partum hemorrhage and mode of delivery.

3-Neonatal variables of birth weight, apgar scores, and admission to the neonatal intensive care unite were also determined.

METHODS OF DATA COLLECTION:

An official permission was obtained from the Obstetric and Gynecological section in Assiut university hospital. The permission was also obtained from the pregnant women and inform them about the purpose of study to obtain their approval and cooperation.

Pilot study:

It was carried out on 10% of the sample (11 women) to clarify the validity and reliability of the questionnaire and then modification was don.

Data were calculated during the period from the beginning of April 2001 to October 2001, through the interview of woman individually in the reception and labor word in obstetric and gynecological department to fill the questionnaire sheet

Analysis of data:

The obtained data were coded, analyzed and tabulated, descriptive statistics as frequency and percentages were calculated using computer. Chi square test was used and P values less than 0.05 were considered as statistically significant.

Ethical Aspect:

1-It is an observational non-interventional study.

2-Women were approached; study explained to them and an informed consent (verbal) was obtained.

3-Ethical approval was obtained from the ethical committee of the faculty of medicine, Assiut University.

RESULTS:

Table (1) gives that the mean maternal age, weight and body mass index in the obese women was greater than the mean in the non-obese women, while the mean of maternal height in the non-obese women was greater than the mean height in the obese women. Also shows that the mean maternal gestational age was similar in the two groups. The table also, shows highly statistical significant difference of weight and body mass index between two groups P: 0.000.

Table (2) gives that 21.8% of obese women had diabetes mellitus versus 3.6% of non-obese women and 34.5% of obese women were had chronic hypertension versus 5.5% of non-obese women. In this table also shows that about three quarter (74.5%) of the non-obese women did not have complications, versus (12.7%) of obese women. The same table revealed that significantly difference at variables diabetes mellitus, chronic hypertension and no complications but no significant difference were observed among the matched variables.

From Table (3), it can be noticed that increased percentage of gestational diabetes premature rupture membrane and placenta previa (9.1%, 32.7% and 14.5%) respectively among obese pregnant women than among non obese pregnant women (0.00%, 29.1% and 3.6%) respectively. Increased percentage of pre-eclampsia, twins and no complication (16.4%, 12.7 and 38.2%) respectively among non-obese pregnant women than among obese pregnant

women (14.5%, 3.6% and 25.5%) respectively. This table also illustrated that statistical significant difference at variables placenta previa P: 0.047 and no complication P:0.010 while no differences in the occurrence of gestational diabetes, pre-eclampsia, twins and premature rupture membrane.

Table(4) gives that the mode of delivery and indication of Cesarean section. It was found that no significant difference was observed between two groups for the mode of delivery. While shows increase percentage of indication of caesarian section at variables antepartum hemorrhage, sever eclampsia, breach presentation and failure of progress (30.0, 30.0%, 10.0% and 10.0%) respectively for obese pregnant women than non obese pregnant women (11.1%, 22.0%. 5.5%0.0%) respectively. This table also revealed that increase previous caesarian section, post date and fetal distress among non-obese (44.4%, 5.5% and 11.1%) respectively women than among obese women (10.0%, 0.0% and10.0%) respectively.

Prenatal outcome of pregnancy is given in table (5). It is noticed that the neonate born to obese women and admitted to intensive care unite was grater (20.0%) than born to non obese women and admitted to intensive care unite (12.7%). Also, highly statistical significant difference at variables preterm P: 0.005 and admission to the intensive care unite P: 0.006 is found.

Table (1): Sociodemographic Distribution of obese and non obese group

Items	Obese "N=55" Mean ± Std	Non obese "N=55" Mean ± Std	P- value
Age:			
-25-30	22.43±1.82	22.31±1.92	0.02
-30-35	28.32± 1.34	29.11± 1.16	0.001
-35- 40	32.75± 1.38	34.4± 0.89	0.214
Weight	94.3±21.46	66.3±6.44	0.000*
Height	153.1±28.65	187.4±30.116	0.215
Body mass index	35.74±5.6	26.3±1.92	0.000*
Parity	2.3±1.4	1.8±1.1	0.310
Gestation age	39.9±11.02	39.5±10.3	0.480

Table (2): Distribution of medical complication in pervious pregnancy in both groups

Item	Obese "N = 55"		Non obese "N= 55"		P- value
	No	%	No	%	
Diabetes mellitus	12	21.8	2	3.6	0.040*
Chronic hypertension	19	34.5	3	5.5	0.000*
Pervious abortion	13	23.6	9	16.4	0.25
Previous stillbirth	2	3.6	-	-	-
Pervious neonatal death	2	3.6	-	-	-
No complication	7	12.7	41	74.5	0.000*

***Statistical significant difference.**

Table (3) : Distribution of Maternal Complication in the current pregnancy

Items	Obese "N=55"		Non obese "N=55"		P- value
	No	%	No	%	
Gestational diabetes	5	9.1	0	0	-
Preeclampsia	8	14.5	9	16.4	0.5
Twins	2	3.6	7	12.7	0.081
Premature rupture membranes	18	32.7	16	29.1	0.418
Placenta previa	8	14.5	2	3.6	0.047*
No complication	14	25.5	21	38.2	0.010*

Table (4) : Distribution of mode of delivery and indications of cesarean section in both groups

Item	Obese "N=55"		Non obese"N=55'		P-value
	No	%	No	%	
Mode of delivery:					
-SVD+ episiotomy	35	63.6	37	67.3	0.421
-Cesarean section.	20	36.4	18	32.7	
Indication of cesarean section:					
-Ante partum hemorrhage	6	30	2	11.1	0.001*
-Previous Cesarean section.	2	10	8	44.4	0.000*
-Post date	0	0	1	5.5	-
-Fetal distress	2	10	2	11.1	0.425
-Sever pre eclampsia	6	30	4	22.2	0.281
-Breach Presentation	2	10	1	5.5	0.0832
-Failure of progress	2	10	0	0	-

Table (5) : Distribution of prenatal out come of pregnancy in both groups

Items	Obese "N=55"		Non obese "N=55"		P- value
	No	%	No	%	
Sex					
Male	26	46.3	19	34.5	0.114
Female	29	52.7	36	65.5	
Shoulder dystocia	0	0	1	1.8	-
Admission NICU	11	20.0	7	12.7	0.006*
Congenital anomalies	0	0	1	1.8	-
Birth weight (gram)	3347.27±451.9		2956.60±513.28		0.000*
Apgar scores after1min	8.80±1.26		9.23±1.33		0.081
Apgar scores after5min	9.69±0.539		9.42±1.95		0.320

***Statistical significant difference.**

DISCUSSION:

Evidence is emerging to suggest that obesity is a global epidemic now and that the prevalence of overweight and obesity is increasing worldwide at an alarming rate affecting both developed and developing countries[11]. The prevalence of obesity is rising steadily all over the world, in developed as well as in many developing countries. The need to tackle obesity is a risk factor for a range of medical consequences: coronary heart diseases, hypertension, diabetes, respiratory distress and osteoarhritis[12]. Egypt Human development[4] reported obesity as one of the actual major risk factors in Egypt with a prevalence of 38 percent of the population above 20 years old. Many studies[8-10] conducting in Egypt revealed that obesity is becoming a problem of public health importance affecting different social and economic classes as well as different age groups.

The nutrition transition in Egypt has occurred in the context of abundant dietary energy

availability, urbanization and moderate fate intakes. The prevalence of obesity in adults is very high, particular among women[3]. The impact of obesity during pregnancy on mother and newborn has been the subject of several investigations of various designs and out comes[12].

Considering the high prevalence of obesity among women of childbearing age, however, this is a major public health issue. In 1995, it was found in a retrospective study that the cost of prenatal care in overweight women exceeded that in normal-weight control subject by 5.4- to 16.2- fold depending on the degree of obesity[26].

The present study agreed with the pervious study done by Perlow[1] who found that the mean maternal weight in the massively obese group was significantly greater than that in the control group.

Perlow[1] found that weight was significantly related to obese pregnant women (0.001), while parity and age were not significantly related to obese pregnant women. This finding agreed with the present study which revealed that the maternal factors including weight and body mass index were significantly related to obese pregnant women, while the parity and gestational age are not significantly related to obese pregnant women as given in Table (1).

The association between hypertension and obesity is well documented. Both systolic and diastolic blood pressure increase with the rise in body mass Index (BMI) and obese individuals are at higher risk of developing hypertension than are in lean subjects[6]. The risk of developing hypertension increases with the duration of obesity, especially in women, and weight reduction leads to a fall in blood pressure[7]. The present study revealed that Chronic hypertension and diabetes mellitus the obese pregnant women was significantly greater than in non-obese pregnant women. While abortion, stillbirth and neonatal death in the obese pregnant women greater than in non-obese pregnant women but not significant. Also this study illustrated that the pregnant women with out complication in the previous pregnancy highly significant greater in non-obese pregnant women than in obese pregnant women (74.5% vs. 12.7 P: 0.000) as in Table (2).

Hypertensive disorders are significantly more prevalent in obese pregnant women than in their lean counterparts. Even when overweight is moderate the occurrence of hypertension and preeclampsia is significantly higher than that in control patients[27-30].

In obese women, the incidence of hypertension is 2.2-21.4 times greater than in control subjects, and preeclampsia occurs 1.22-9.7 times more often[31-35]. The incidence of small gestational age infants is usually not higher on obese patient than in normal-weight control subjects[13]. Massive obesity in pregnant women is a risk factor for a multitude of adverse prenatal outcome including complications during pregnancy such as insufficient weight gain, hypertension, preeclampsia, gestational diabetes, edema and premature rupture of membrane[14]. More than one author reported a higher frequency of induction of labor in obese women than in normal- weight women[11,13,17].

The rate of cesarean section in deliveries in obese women is constantly higher, with a 1.15 to 3.0 fold increase over the rate in control groups [1,10,20,30]. The present study revealed that no statistical significant difference related to Gestational diabetes and cesarean section (9.1vs. 0% and 36.4vs. 32.7%) for obese and non- obese pregnant women, the present study was in disagreement with the previous study which[32] who found that morbidly obese women was significantly adverse prenatal outcomes

including gestational diabetes (24.5 vs. 2.2% P<0.001) and cesarean section (15.2 vs. 9.3% P<0.05). The present study also shows that preeclampsia and twins were common among non-obese pregnant women than obese pregnant women (16.4v.s 14.5% and 12.7 vs. 3.6%), while the premature rupture of membrane common among obese pregnant women than non-obese pregnant women (32.7 vs.29.1). On the other hand it shows significant difference related to placenta- previa (14.5vs3.7% P<0.010) as in Table (4).

Ante-partum complications of obesity largely account for this higher cesarean delivery rate, and the percentage of cesarean deliveries in obese women without obesity-related complications is similar to that in control subjects[18]. The present study reported that ante partum hemorrhage, sever preeclampsia, breach presentation and failure of progress common among pregnant obese women than non- pregnant non-obese women (Table 4). Reasons reported for surgery general includes macrocosms- associated cephalopelvic dysproportion, fatal distress, and stagnation of includes labor. Anesthetic and postoperative risks are also high in obese patients and massive obesity increases preoperative total operative time, blood loss, and endometriosis[4].

Macrosomia increase the risk for shoulder dystocia, birth injury, depression of Apgar scores and perinatat death[5]. The present study was in disagreement with the previous statement, which revealed that to shoulder dystocia and congenital anomalies present among non-obese pregnant women and not present among obese pregnant women (Table 5).

Maternal obesity is a risk factor for congenital abnormalities[3]. The percentages of infants requiring admission to a neonatal intensive care unit 3.5 times higher than that in cases of maternal obesity[16,18,20]. Obesity also leads to significantly longer post partum hospital stays as a result of more frequent cesarean deliveries and endometriosis[7]. The recent study was in agreement with the previous study which found that significant difference related to admission to intensive care unit (20.0 vs. 12.7% P<0.006) for obese and non-obese pregnant women (Table 5).

Even moderate overweight has a significant deleterious effect on the outcome of pregnancy, and obesity lead to major maternal and fetal complications. Dereure[13] Apgar scores are slightly more in infants of obese mothers than in infants of normal mothers[12,15,16]. The present study revealed that the mean Apgar scores after one minute and after five minute (8.80±1.26 vs. 9.23±1.33 and 9.69±0.53 vs. 9.42±1.95) for obese and non- obese pregnant women.

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تأثير السمنة في السيدات الحوامل على الأم والطفل حديث الولادة في مستشفى الجامعى بأسيوط

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الهدف من هذه الدراسة هي معرفة تأثير السمنة على السيدات الحوامل وعلى محصلة الحمل بين السيدات ذات السمنة والسيدات اللاتي لا يعانين من السمنة. تمت هذه الدراسة في قسم الولادة بمستشفى جامعة أسيوط في الفترة من أبريل إلى أغسطس سنة 2001م . حيث كان هناك استمارة استبيان لكل سيدة على حدى تملأ بمعرفة الباحث، والاستمارة تحتوى على بيانات شخصية وبيانات طبية وجراحية وبيانات خاصة بالوزن وقياسات الوزن. والدراسة شملت 110 سيدة حامل قسمت إلى مجموعتين المجموعة الأولى 55 سيدة حامل ذات سمنة والمجموعة الثانية 55 سيدة حامل بدون سمنة.

وقد دلت النتائج عن عدم وجود فرق إحصائي بين المجموعتين من حيث البيانات الشخصية ولكن تبين وجود فرق بين المجموعتين من حيث المضاعفات الطبية مثل السكر وسكر الحمل، ارتفاع ضغط الدم المزمن، وأيضا انضغام المشيمة حيث وجد أن المجموعة ذات السمنة عرضة أكثر لهذه المضاعفات من المجموعة الضابطة. أيضا لا يوجد فرق بين المجموعتين من حيث تعرضهما إلي العمليات القيصرية، ولكن وجد هناك فرق في الأطفال حديثي الولادة حيث أن السيدات ذات السمنة المفرطة كان مواليدهن عرضة للوزن الزائد ودخولهم وحدة الأطفال المبتسرين.

ومن هذه الدراسة وجد أن السمنة لها تأثير سلبي على الأم والطفل حديثي الولادة، وتوصى الدراسة بإجراء بحث على عدد أكبر من السيدات للوصول إلي نتائج ذات دلالة إحصائية.