Assessment of Antenatal Complications with Obesity at Qena University Hospital

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Abstract:

Background: The rapid upswing in obesity prevalence across nations, ages, and ethnic groups has reached pandemic proportions. There is a significant increase in the incidence of obesity with a prevalence of 2%–55% in adult females. **Aims of the study** to assess the hospital based rate of obesity among high risk pregnant women at Qena University Hospital, assess the antenatal obstetric and medical complications associated with obesity among these women, and provide health education about the dietary requirements. **Subjects and methods** Cross Sectional research design was carried out in this study. A simple random sample of high risk pregnant women (350) seeking care at Qena University Hospital were recruited. A Screening sheet used for detecting the rate of obesity by anthropometric measurements, then for obese women: a structured interviewing questionnaire was used to complete socio-demographic data, obstetric history, maternal medical history, family history, current antenatal risk factors associated with Obesity. **The main results**: more than half (57.4%) of high risk pregnant women were classified as obesity class one. Obese women were at increased risk of pregnancy complications such as previous caesarean section (38.3%), premature rupture of membrane were (13.4%), pregnancy induced hypertension (11.7 %). **Conclusion** hospital based rate of obesity was one third of the total flow of pregnant women at this hospital was obese with high risk pregnancy and the most common obstetrics' complications associated with obesity were previous caesarean section and premature rupture of membrane respectively.

Key wards: Obesity, antenatal complications.

Introduction:

Obesity has become an epidemic worldwide .World Health Organization (WHO) has declared obesity as a major killer disease of the millennium on par with HIV and malnutrition. Millions suffer health related problems ranging from premature death to reduced overall quality of life. World Health Organization and the National Institutes of Health (NIH) define Obesity as it is an excessive accumulation of fat that adversely affects well-being and health. Overweight as a body mass index (BMI) of 25–29.9 and obesity as a BMI of 30 or greater **(WHO, 2010).**

The United States National Health and Nutrition Examination Survey (NHANES) indicated that 66.3% of adults in the United States of America (USA) are either overweight or obese, with half of them in the latter category. As obesity becomes an ever-growing concern, the number of women of reproductive age who are overweight or obese increases and the incidence of obesity among pregnant women is now estimated at between 18.5% and 38.3%, **(Yogev and Catalano, 2009).** In the United kingdom (UK) 24% of all women are obese and 34% are overweight (BMI 25–29.5). In the reproductive age group (25–44 years) more than 50% of women in the UK are overweight or obese. Over

15 years, from 1990 to 2004, there has been a 60% increase in maternal obesity. In Ireland one in five women attending antenatal clinics is obese, **(Fattah, et al, 2009).**

Overweight and obese women are at increased risk of several pregnancy complications, including gestational diabetes mellitus, hypertension, preeclampsia, cesarean delivery, and postpartum weight retention. Similarly, fetuses of pregnant women who are overweight or obese are at increased risk of prematurity, stillbirth, congenital anomalies, macrosomia with possible birth injury, and childhood obesity (**ACOG, 2013).**

There is increased risk of hypertensive disorders of pregnancy associated with obesity. For obese nulliparous patients, the risk of gestational hypertension is estimated to be 2.5 times greater and 3.2 times greater with severe obesity. Pre-eclampsia is also increased, with 1.6 times and 3.3 times greater risk with obesity and severe obesity, respectively. **(Mostello, et al, 2010).** Cesarean birth is one of the risks for women with obesity reported rates in normal-weight, overweight, and women with obesity of 18%, 25.1%, and 36.4%, respectively (**Fyfe et al., 2011).**

In 2010 WHO statistics for obesity prevalence in other developed and developing countries. Kuwait ranks the 9th in the world and first amongst Arabic-speaking countries in female obesity. The rank order in Arabic-speaking countries for obesity in females is Kuwait (55.2%), Egypt (48%), and United Arab Emirates (42%), which is higher than all the European countries and about the same as USA (48.3%) and Mexico (41%). (**Badran , and Laher,2011).**

 In Egypt, the prevalence of obesity is increasing according to Egyptian Demographic and Health Survey "EDHS" 2008. According to this statistics, overweight and obesity was higher in women with no education (73%) when compared with women with completed secondary or higher education (67.5%). The prevalence of overweight was 28.3% but the prevalence of obesity was about 39.5% according to statistics from DHS, **(DHS, 2008).**

Obese women are at increased risk of several pregnancy complications; therefore, preconception assessment and counseling are strongly encouraged. Obstetric Nurse should provide education about the possible complications and should encourage obese patients to undertake a weight- reduction program, including diet, exercise, and behavior modification, before attempting pregnancy. Specific medical clearance may be indicated for some patients. (**ACOG, 2013).**

At the initial prenatal visit, height and weight should be recorded for all women to allow calculation of BMI, and recommendations for appropriate weight gain should be reviewed both at the initial visit and periodically throughout pregnancy. (**ACOG, 2013).** Patients planning a pregnancy should be counseled that achieving a successful pregnancy may be more difficult with obesity. **(Bellver, et al., 2006) and (Bellver, et al, 2010).** Investigations for the presence of chronic hypertension, diabetes, and proteinuria allow patients to optimize medical care before pregnancy.

Aims of the study:

- To assess the hospital based rate of obesity among high risk pregnant women at Qena University Hospital.
- To assess the antenatal obstetric and medical complications associated with obesity among these women.

Subject and Method
I- Research design:-
Descriptive Research – design was carried out in this study.

II - Setting
The study was conducted at the inpatient antenatal ward at Qena University Hospital which its capacity in total (11) cases and four nurses are distributed among three shifts .Qena university hospital is the first important health settings serves most of cases from rural and urban areas at Qena city . At Qena University Hospital the patient is admitted from outpatient clinic or referred from private clinics. The outpatient clinic of Obstetrics and Gynecology is working four days per week.

III- Sampling
Convenient sample of high risk pregnant women seeking care at Qena University Hospital was used. Screening of the total flow of pregnant women admitted, and from the total flow taking the obese pregnant women, the sample was calculated using Epi-Info statistical package, version 3.3 with power 80%, a value of 2.5 is chosen as the acceptable limit of precision (D) at 95% level of confidence (CI), with expected prevalence 30%, and worst acceptable 55%. Accordingly, sample size was estimated to be 350 +10% individuals to guard against non-respondense rate.

Inclusion criteria:

∗ All high risk pregnant women with single fetus who have the BMI ≥ 29 (With weight gain during pregnancy from 5-9 kg according to Canadian gestational weight gain recommendations and Institute of Medicine (IOM).

Pre-pregnancy BMI category	Recommended range of total weight gain	
	Kg	**Lbs**
BMI < 18.5 (Underweight)	12.5 – 18	28 – 40
BMI 18.5 - 24.9(Normal weight)	11.5 – 16	25 – 35
BMI 25.0 - 29.9(Overweight)	7 - 11.5	15 – 25
BMI ≥ 30^{c}(Obese)	5 – 9	11 – 20

∗ Institute of Medicine (IOM) Canada, 2009.

∗ **Exclusion criteria**:

▪ All high risk pregnant women who have BMI <29.

IV- Tools for data collection:
Semi- structured interviewing sheet:
This tool was designed by the researcher based on review of literature and consulting expertise in this area, it was structured to include several parts:

I. The assessment stage:

1. **Screening** for all pregnant women for **anthropometric measurement**: such as height and weight to determine body mass index (BMI). BMI was calculated as weight in kilograms divided by height in meters squared, to assess the prevalence of obesity among high risk pregnant women.

2. **For obese women: a structured interviewing sheet which** includes **socio-demographic data** as: name, age, educational levels, occupation and residence.

3. **Obstetric history which Includes:** gravidity, parity, abortions, stillbirth, number of neonatal deaths and number of living children.

4. **Outcomes of last delivery:** Spontaneous vaginal delivery (**SVD**), SVD + episiotomy, instrumental delivery and caesarean section.

5. **Mother's Medical history: as** obesity, hypertension, diabetes, cardiovascular disease, liver diseases, kidney disease, respiratory diseases and others.

6. **Family history: as** obesity, hypertension, diabetes, cardiovascular disease and others.

7. **Current antenatal risk factors associated with obesity:**
Weeks of gestations and current antenatal risk factors as, Pregnancy induced hypertension, diabetes mellitus, pre mature rupture of membrane (PROM) , polyhydrominus, Intra uterine Fetal Death (IUFD), Intra uterine growth restriction (IUGR), previous cesarean section ,cardiovascular disorders, oligohydrominus, hepatic disorders, renal disorders, Preterm labor, Fetal macrosomia , respiratory disorders with pregnancy, gastrointestinal problems with pregnancy ,others and more than one risk factor.

8. Current medical diagnosis.

9. Investigations:

A) Laboratory investigations as CBC, Urine analysis and others.

B) Abdominal ultrasound.

C) Trans Vaginal Ultrasound.

10. Health education was given for those women about nutritional requirements according to their current medical diagnosis. The investigator designed brochures to aid the women for understanding the instructions of health education. women welcomed for giving a small session for all obese women, giving brochures, answering their questions associated with their problems and needs. Providing general health education about the dietary requirements during pregnancy throughout written prepared brochure provided for women and answering any question about instructions written in brochure which written in arabic language, containing figures for illiterate women.

II. Administrative Design:
Procedure:
An official permission was obtained from the Dean of the Faculty of Nursing, Assuit University directed to the head of the Department of Obstetrics & Gynecology at Qena University Hospital, the purpose and nature of the study was explained for taking their approval to carry out the study. Oral consent was obtained from pregnant women to participate in the study after explaining purpose and the nature of the study. The data was collected four days a week .The investigator assured voluntary participation and confidentiality of each woman who agreed to participate. The investigator interviewed the pregnant women and taking their height and weight to calculate the body mass index for all of them. The investigator completed the study with pregnant obese women only .Screening for the Rate of obesity by calculating body mass index and revising inpatient record monthly to assess the prevalence of obesity among pregnant women. Time taken with every case about 20 minute. The women who excluded from the study were recorded in a separated sheet for non obese pregnant women. Completing a structured interviewing sheet from all obese pregnant women who meeting my inclusion criteria ,giving health education about nutrition according to their diagnosis, giving them brochures and explaining how to apply its advices.

III. Operational Design
Pilot study*:*
A pilot study was carried out on (10%) obese pregnant women, the sample was excluded from the study, and this pilot was done to identify the clarity of the tools and there was some modifications of the tool after pilot study done such as family history, medical history and Obstetric history and those cases were excluded from study sample and the total number was the same before and after pilot study.

Ethical considerations
A Clear explanation of the nature and the aim of the study were given to the women to obtain their informed verbal consent which includes the rights for privacy and confidentiality, and the obese women have a right for withdrawal from the study.

Field work:
Starting the study and data collection from 20/10/2012 till 20/4/2013, at the inpatient antenatal ward at Qena University Hospital which its capacity in total (11) cases, the patients were admitted from outpatient clinic or referred from private clinics. The outpatient clinic of Obstetrics and Gynecology is working four days per week.

Statistical analysis:
Data were analyzed using the Statistical analyses were carried out using the Statistical Package for the Social Sciences (SPSS) version 16 and (Windows Microsoft).Continuous data were expressed as frequency, percentage; mean and standard deviation (SD) . Discrete data were expressed as frequency and percentage. Comparison between variables was done

using chi-square (x2) test and One-Way ANOVA test was used for qualitative data. Probability (p-value) less than or equal to 0.05 was considered significant and less than 0.001 was considered highly significant.

Limitations of the study:

▪ This study has some limitations. It did not have sufficient statistical power to detect relatively common adverse outcomes, such as pregnancy induced hypertension and preeclampsia, or detect relatively rare adverse outcomes intrauterine fetal death and neonatal death. Moreover, because small sample size and it is impossible to have every woman's weight objectively measured just before she becomes pregnant.

In sufficient equipment at antenatal ward at the hospital such as scale.

Results:

Table (1): Distribution of the pregnant women according to their socio-demographic characteristics.

| Socio-demographic Characteristics.	Frequency (N=350)	Percentage(%)
Age		
• 15-24 years	123	35.1
• 25-34 years	197	56.3
• 35-45 years	30	8.6
• **Total**	350	100
(Mean ± SD)	28.28 ± 5.52	
Educational level		
• Illiterate	83	23.7
• read and write	23	6.6
• primary school	22	6.3
• preparatory school	52	14.9
• secondary school	132	37.7
• University	38	10.9
• **Total**	350	100
Occupation		
• house wife	331	94.6
• Employed	19	5.4
• **Total**	350	100
Residence		
• Urban	120	34.3
• Rural	230	65.7
• **Total**	350	100

Figure no (1): Classifications of obesity among pregnant women
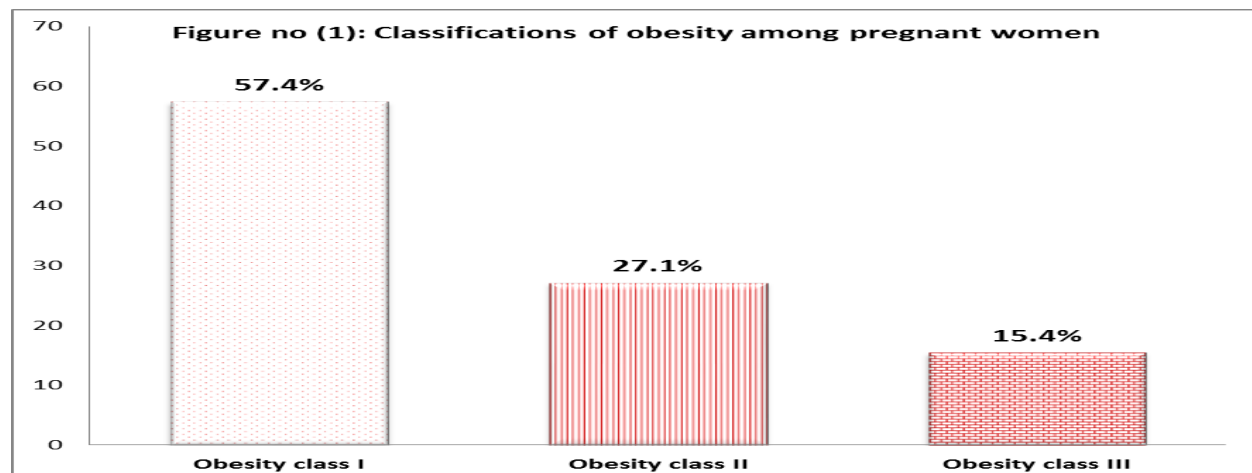
Table (2): Distribution of women regarding to current antenatal risk factors.

Current risk factors	Frequency (n=350)	Percent
Weeks of gestation (mean ±SD)	38.7 ± 2.6	
Current antenatal risk factor • None	119	34.0
• Pregnancy induced hypertension	41	11.7
• IUFD	7	2.0
• IUGR	1	.3
• Polyhydrominus	15	4.3
• Oligohydrominus	37	10.6
• Diabetes mellitus	8	2.3
• PROM	47	13.4
• Fetal macrosomia	10	2.9
• Preterm labour	22	6.3
• Previous cesarean section	128	36.6
• Cardiovascular disorders	1	.3
• Hepatic disorders	0	0
• Renal disorders	3	.9
• Respiratory disorders with pregnancy	7	2.0
• Gastrointestinal problems with pregnancy	12	3.4
• Others	57	16.3
• More than one risk factors	125	35.7

Table (3): The relation between Family history and obesity classes of pregnant women.

Family history	BMI						P. value	P. value
	Obesity clas I N = 201		Obesity class II N = 95		Obesity class III N = 54			
	No.	%	No.	%	No.	%		
None	39	61.9	19	30.2	5	7.9	**0.001***	
Obesity	30	50.0	13	21.7	17	28.3	**0.019 ***	
Hypertension	83	50.9	46	28.2	34	20.9	**0.001***	**0.275**
Diabetes	74	48.4	44	28.8	35	22.9	**0.001***	
Multiples pregnancies	87	55.8	41	26.3	28	17.9	**0.001***	
Cardiovascular disease	21	51.2	14	34.1	6	14.6	**0.016***	
Others	16	61.5	7	26.9	3	11.5	**0.001***	

Table (4): The relation between Current antenatal risk factors and body mass index of pregnant women.

Current antenatal risk factors associated with pregnancy	BMI						P. value	P. value
	Obesity class I (N =201)		Obesity class II (N = 95)		Obesity class III (N =54)			
	No.	%	No.	%	No.	%		
None	74	62.2	32	26.9	13	10.9	**0.001***	
Pregnancy induced hypertension	9	22.0	16	39.0	16	39.0	0.303	
IUFD	3	42.9	1	14.3	3	42.9	0.565	
Polyhydraminos	4	20.0	6	33.3	7	46.7	0.662	
Oligohydraminos	25	67.6	7	18.9	5	13.5	**0.001***	
Diabetes mellitus	3	37.5	1	12.5	4	50.0	0.417	
PROM	23	48.9	16	34.0	8	17.0	**0.027***	**0.002***
Fetal macrosomia	2	20.0	3	30.0	5	50.0	0.497	
Preterm labour	12	54.5	9	40.9	1	4.5	**0.012***	
Previous cesarean section	74	57.8	35	27.3	19	14.8	**0.001***	
Renal disorders	2	66.7	0	0.0	1	33.3	0.564	
Respiratory disorders with pregnancy	4	57.1	2	28.6	1	14.3	0.368	
Gastrointestinal problems with pregnancy	5	41.7	2	16.7	5	41.7	0.472	
More than one risk factors	61	48.8	37	29.6	27	21.6	**0.001***	
Others	35	61.4	13	22.8	9	15.8	**0.001***	

*   P ≤ 0.05

Table (5): The relation between current medical diagnosis and obesity classes of pregnant women.

	BMI						P. value
	Obesity class 1 N =201		Obesity class II N =95		Obesity class III N =54		
	No.	%	No.	%	No.	%	
Current medical diagnosis							
• Cephalic	188	57.8	86	26.5	51	15.7	**0.001***
• Breech	12	60.0	6	30.0	2	10.0	**0.022***
• Transverse lie	1	20.0	3	60.0	1	20.0	0.449
• In labour	89	57.8	48	31.2	17	11.0	**0.001***
• Not in labour	112	57.1	47	24.0	37	18.9	**0.001***
• Oligohydraminos	17	65.4	4	15.4	5	19.2	**0.001***
• Sever oligohydraminos	7	70.0	3	30.0	0	0.0	**0.002***
• Polyhydraminos	4	28.6	4	28.6	6	42.9	0.206
• Sever polyhydraminos	0	0.0	0	0.0	1	100.0	0.751
Previous CS	76	56.7	38	28.4	20	14.9	**0.001***
Pre Eclampsia	5	26.3	7	36.8	7	36.8	0.810
Antepartum Haemorrhge	6	85.7	0	0.0	1	14.3	**0.059***

	BMI						P. value
	Obesity class 1 N =201		Obesity class II N =95		Obesity class III N =54		
	No.	%	No.	%	No.	%	
PROM	21	47.7	15	34.1	8	18.2	**0.056***
Postdate	12	70.6	1	5.9	4	23.5	**0.003***
Preterm Labour	15	53.6	9	32.1	4	14.3	**0.039***
Pregnancy Induced Hypertension	8	22.9	14	40.0	13	37.1	0.412

* $P \leq 0.05$

The results of the study revealed that the hospital based rate of Obesity among high risk pregnant women (No. of obese women 350/ total high risk women 1119)*100 was 29.4%.

Table (1): Shows that more than half (56.3%) of the women ranged from 25- 34 years as regards age group with mean age 28.28 ± 5.52. Regarding to the level of education, more than one third of women (37.7%) had secondary education. As regards occupation, it was estimated that the majority of women (94.6%) were housewives, while more than two third (65.7%) were from rural areas.

Figure (1) shows the distribution of high risk pregnant women according to obesity classes, it was revealed that more than half of women (57.4%) had class one, (27.1%) had class two and the rest of them had class three (15.4%) .

Regarding to Obstetric profile, the majority) (84.3%) of women were multigravida. As regards Parity ، more than one thirds (41.71%)were delivered from one to two times. Concerning mode of delivery, the results revealed that more than one-third of women had spontaneous vaginal delivery and C-Section (37.4%, 37.7%) respectively.

Regarding to current risk factors associated with pregnancy,

table (2) shows that the mean regards weeks of gestation was 38.7 ± 2.6. More than one third of women free from current risk factors and had a history of Cesarean Section (34.0% & 36.6%) respectively.

It can be noted that, there were no statistically significant difference between obesity and family history in general (p = 0.275) as shown in

table (3) Concerning to current antenatal risk factors, it can be observed in

table (4) that there was a statistically significant difference with obesity classes in general (p = 0.002).

Table (5) shows that there are statistical significance differences among current medical diagnosis and classes of obesity (P ≤ 0.05)

Regarding to laboratory investigations which had been done for pregnant women at the hospital, most of women had all laboratory investigation as routine care. The laboratory investigation started from complete blood picture (39.4%), followed by random blood sugar (28.9).some investigation had been done when need such as hepatitis markers (16.9%).

Discussion:

Obesity was recognized as a risk factor in pregnancy more than 50 years ago. Since then, numerous retrospective, prospective and case–control studies have demonstrated the association between maternal obesity and various pregnancy complications. This forms a continuum of risk from preconception through to the intra partum and puerperal period. This discussion will provide an overview of the clinical and scientific literature regarding obstetric complications of maternal obesity. **(Greer, et al., 2010).**

Concerning to the rate of obesity during pregnancy, the current study reveals that nearly one third of high risk pregnant women had obesity by its classes (29.3%). Nearly more than one half of them were obesity class one (57.4%), while obesity class two about (27.1%), and obesity class three was (15.4%).

Similarly, the prevalence of obesity in the United States has increased dramatically over the past 25 years. NHNES found that in the United States, more than one third of women are obese, more than one half of pregnant women are overweight or obese, and 8% of reproductive-aged women are extremely obese. **(Flegal, et al., 2012)**.

This rate is higher than what mentioned before at UK, 2010 that the prevalence of women with BMI ≥ 35at any time during pregnancy was 4.99%, BMI ≥ 40 morbid obesity 2.01%. The prevalence of obesity (BMI ≥30) in the general population in England has increased markedly since the early 1990s and currently affects an estimated 18.5% of women of childbearing age. **(Greer, et al., 2010).**

At the same line, the prevalence of obesity in another study at Nigeria 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; Israel et al., 2011**).

The rank order in Arabic-speaking countries for obesity in females is Kuwait (55.2%), Egypt (48%), and UAE (42%), which is higher than all the European countries**. (Badran, and Laher, 2011).** But Prevalence of obesity in Egypt was about 39.5% according to statistics from DHS, (**DHS, 2008**).

Concerning to Socio-demographic characteristics of the obese pregnant women, the current study illustrates that there was a statistical significant difference between special category >25-34 and obesity .This finding was supported by **Aekplakorn ,et al. 2007; Balarajan and Villamor , 2009; Nasreen ,(2009); Rayis, et al, 2010 and Mustafa,2010.**

As noted from current study, obstetric history revealed that there was no significant association between obesity and parity. This is similar with what mentioned before by (**Salah, et al. 2009**) who stated that Parity does not seem to have any impact upon body weight gain within study group nevertheless, obese women add significantly more body weight than non obese in all patients.

According to the findings of the current study, it can be observed that there wasn't a statistical significant difference between still birth and obesity (p= 0.728). However, this task has been addressed in a cohort study which its results confirmed a higher rate of unexplained still birth in the obese group, even when hypertensive and diabetic women were excluded. (**Black and Bhattacharya, 2013**).

This finding was contradicted with Salihu et al., found in a large cohort of 134 527 obese women that overall obese mothers were about 40% more likely to experience stillbirth than non-obese women. (**Yogev and Visser (2009).**

The current study showed that there was a statistical significant difference between neonatal death and obesity .This findings attributed to the fact that neonates born to obese mothers are at increased risk of complications including admission to neonatal intensive care, macrosomia, low Apgar scores, and prenatal death. There is no previous studies that have investigated the effect of maternal obesity on neonatal mortality in low-income countries, where the burden of neonatal mortality is greatest. **Jenny ,et al.,2012).**

According to the findings of the current study, it can be observed that there was a statistical significant difference between mode of delivery especially spontaneous vaginal delivery and degree of obesity. In agreement with this findings by (**Sturk et al, .2013**), who stated that obese but otherwise healthy women had a higher proportion of spontaneous vaginal delivery than women with a normal weight.

The present study revealed that, there was a statistically significant association between Cesarean Section rate and increasing Body mass Index in the pregnant women. This finding agrees with what was mentioned before, that Cesarean Section increased with increasing body mass index. 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 findings were consistent with **Aghamohammadi, (2011) and Hashmi et al, (2010)** who found that cesarean section rate in the obese group was significantly high (64.4%, 37.3%) respectively.

Similarly many previous reports **Doherty, et al., (2006); Bhattacharya, et al., 2007; Leung et al., (2008),** stated that obese women were at increased risk compared with the normal weight women to pregnancy induced hypertension, preeclampsia, gestational diabetes mellitus, macrosomia and caesarean section or due to reduced rate of cervical dilatation and increased depot of soft tissues in maternal pelvis leading to obstructed labor or cephalo-pelvic disproportion. **Bhattacharya et al., 2007; Leung et al., (2008).**

Similarly, **Bullard, (2011**) stated that obese women were more likely to undergo cesarean delivery compared to normal weight women. This study reflects a two fold increase in cesarean delivery among the obese population.

Concerning to maternal medical history, it can be observed that there was a statistical significant difference between obesity and medical history generally. It is worth noting that there are significant association between respiratory disease as a medical history and obesity during pregnancy. This finding s may be related to the fact that Pregnancy induces a number of changes to pulmonary physiology and mechanics. Early in pregnancy, the alveolar ventilation is increased and pregnant women have a sense of dyspnea. Obesity has similar effects on the pulmonary function. Thus, women who are obese and pregnant have minimal to absent pulmonary reserve and are prone to develop hypoxemia easily. **Vasudevan, (2010).**

According to multiple pregnancies as a factor of family history, there was a statistical significant difference with obesity .This findings agrees with what mentioned before, obese women in a study have almost 5 times the risk of carrying a multiple pregnancy compared to non obese group. **Salah, et al (2009).**

Concerning to premature rupture of membrane, the present study revealed that there was a statistically

significant relation between PROM and increasing body mass index. This results similar to **Chen. etal., (2010), Osaikhuwuomwan, (2010) ; Nohr et al.,(2007**), who stated that being overweight or obese before pregnancy, or gaining excessive weight during pregnancy, increased the risk of PPROM due to increasing physical stress that weaken the membrane besides , Obese women are also prone to infections of the genitourinary tract, and during pregnancy the proteases, collagenases, and elastases produced by bacteria can degrade the matrix and collagen of fetal membrane cells, and lead to membrane rupture.

As regards to pregnancy induced hypertension there was no statistically significant difference between obesity and hypertension during pregnancy.

According to hypertension as a mother's medical history and current antenatal risk factor there was no association between hypertension and obesity classification .This findings may be due to the size of the sample was not large enough to prove the association .But, it is worth noting that hypertension as family history of pregnant women significantly associated with increasing body mass index. This finding was similar to a significantly higher rate of pregnancy induced hypertension among obese pregnant women. P<0.001, **Aghamohammadi, (2011).**

The present study revealed that there was no statistical significant difference between obesity and macrosomic fetus. There are studies which stand in opposition, **Gunatilake & Perlow, (2011**) who stated that, women with obesity, independent of GDM, have a two-fold increased risk of macrosomic infants. In the same line **Yu et al., 2006**, stated that 17.5 vs. 9% compared to normal-weight women. Mothers of macrosomic infants are at higher risk for stillbirth, birth trauma such as shoulder dystocia, and poor blood glucose control **McGowan & McAuliffe, (2010).** Also, **Adesina, et al.,(2011**),mentioned that the high rates of macrosomia in this study probably reflect the direct relationship between birth weight and maternal weight. This is further supported by the high rate of normal birth weights among the non-obese.

The present findings revealed that there was a statistical significant difference between obesity and oligohydraminus, this finding may be attributed to the fact that there is a vicious cycle between obesity and other risk factors during pregnancy, so there was indirect relation between obesity and oligohydraminos. It caused by other factors as hypertension, medication taken for hypertension , PROM, post term pregnancy and poor placental perfusion, these factors associated with increasing incidence of obesity and related to that oligohydraminos increased with obesity. It's most common in the last trimester (last 3 months) **March of dimes, (2009).** There was a study confirm this association reported by **Syed, et al, (2012)** who reported that Majority (70.7%) in high risk were post-dated pregnancies related to oligohydraminos.

Conclusions:

The result concluded that the hospital based rate of obesity among high risk pregnant women at Qena University Hospital was one third of the total flow of pregnant women at this hospital. Obesity among high risk pregnancy was ranged from class one which represent about more than half of the sample, class two represent nearly one third of the sample and obesity class three about one fifth. Complications of obesity increased among high risk pregnant women such as previous caesarean section rate more than one third.

Recommendations:
On the basis of the most important findings of the study, the following recommendations are suggested:
1. Preconception assessment and counseling should include the provision of specific information concerning the maternal and fetal risks of obesity in pregnancy and encouragement to undertake a weight-reduction program.
2. At the initial prenatal visit, height and weight should be recorded for all women to allow calculation of BMI from pre-pregnancy and instructions for ideal weight gain
3. Nutrition and exercise counseling should begins from pre-puberty, during pregnancy, continues postpartum and before attempting another pregnancy.

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