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Perinatal and maternal outcome about maternal obesity and overweight in Sudanese women.

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Abstract

Background: Maternal complications, including gestational diabetes mellitus, hypertensive disorders, and delivery of a preterm or a growth-restricted baby, are higher among women with overweight or obesity.

Objective**:** To determine perinatal and maternal outcomes of maternal obesity and overweight among Sudanese women.

Methods**:** It was a descriptive, cross-sectional, and hospital-based study conducted in Bashier Teaching Hospital, Sudan from July 2021 to January 2022. Three hundred pregnant women who fulfilled the inclusion criteria of the study were enrolled in the study. Data was collected using a questionnaire filled with women included in the study and after obtaining informed consent.

Results**:** The mean age was 31.31 ±2.88 among the overweight group and 29.03 ±3.83 among the obese group. The rate of preeclampsia was (38.5% vs. 12.9%), anemia (8.2% vs. 2.2%) , DVT (1.6% vs. 0.0%) , polyhydramnios (6.6% vs. 3.4%) and gestational diabetes (9.8% vs. 4.5%). These were significantly (p-value < 0.05) higher in obese cases as compared to overweight women. Significantly (p-value < 0.05) higher rates

of IUFD (2.5% vs. 0.6%), low Apgar score <7 (30. 3% vs. 11.8%) %), admission to NICU (26. 2% vs. 12.4%) was noted among the obese group.

Conclusion**:** The study concluded that overweight and obesity were associated with significant and higher maternal outcomes such as the development of gestational diabetes, hypertensive disorders, intrapartum and postpartum hemorrhage and other disorders.

Key Words: Perinatal and maternal outcome, maternal obesity and overweight, Sudanese women**.**

Introduction:

Obesity is a global health problem. Among adults of all ages, women generally have higher rates of obesity than men [1]. Rates of obesity in pregnancy are increasing, particularly in developed countries [2]. A survey showed that 55.8% of women of childbearing age (20–39 years) were overweight or obese, defined as having a BMI of 25 or higher [3]. Obesity is a pandemic problem found in many countries. It is estimated that, in 2025, more than 21% of women in the world will suffer from obesity. In the United Kingdom (UK), the prevalence of obesity in pregnancy rose from 9–10 % in the early 1990s to 16–19% in the 2000s [4]. In the Indian subcontinent, the prevalence of obese or overweight married women (15–49 years) rose from 11 to 15% in 2005–2006 as per the National Family Health Survey (NFHS) 3 and further to 20.6% as per NFHS 4. In 2014, an estimated 326,900 individuals were pregnant with obesity in Indonesia. The prevalence of pregnancy with obesity is 1% [5]. There is considerable evidence that maternal obesity during gestation increases the incidence of complications such as childhood obesity, diabetes, cardiovascular diseases, several types of cancer, and metabolic syndrome at multiple life stages in the offspring [6]. In contrast, maternal underweight has a protective effect on these pregnancy complications except for the slightly increased risks of having a baby with low birth weight and intrauterine growth restriction. As many of the physiological changes of pregnancy associated with maternal obesity are present from early pregnancy onward, reducing maternal obesity before conception is probably the best strategy to decrease the health burden of adverse fetal and birth outcomes [7]. The present paper aims to determine perinatal and maternal outcomes of maternal obesity and overweight among Sudanese women.

Material and Methods

It was a descriptive, cross-sectional, analytic, and hospital-based study conducted in Bashier Teaching Hospital, Sudan from July 2021 to January 2022. Three hundred pregnant women who fulfilled the inclusion criteria were enrolled in the study. Participants completed a questionnaire on personal data and clinical history. Questions regarding pregnancy outcome about maternal obesity and overweight. such as , mode of delivery, VTE, and medical disease were included. BMI was calculated as the weight in kilograms divided by the square of the height in meters (kg/m2). The BMI was determined by using the World Health Organization (WHO) classification for obesity.

Statistical analysis was performed via SPSS software (SPSS, Chicago, IL, USA). Continuous variables were compared using the student's t-test (for paired data) or Mann–Whitney U test for non-parametric data. For categorical data, the comparison was done using the Chi-square test (X2) or Fisher's Exact test when appropriate. A P value of < 0.05 was considered statistically significant.

Ethical clearance and approval for conducting this research was obtained from the general manager of the hospitals. Informed written consent was obtained from every respondent who agreed to participate in the study. The respondents informed that the study is not associated with experimental or therapeutic intervention while information was collected from them.

Results

The mean age was 31.31 ±2.88 among the overweight group and 29.03 ±3.83 among the obese group with no significant differences. The mean parity was 4 ±2 among the overweight and 5±2 among the obese group with a significant difference. The mean GA at delivery was 37 ±1 among the overweight, and 35±2 among the obese group with considerable difference. The majority of women 201 (67.1%) were booked. Table 1 . The rate of preeclampsia (38.5% vs. 12.9%), anemia (8.2% vs. 2.2%) , DVT (1.6% vs. 0.0%) , polyhydramnios (6.6% vs. 3.4%) and gestational diabetes (9.8% vs. 4.5%) were significantly (p-value < 0.05) higher in obese cases as compared to overweight women. Significantly (p-value < 0.05) higher rates of postpartum complications like PPH (36.1% vs. 13.5%), postpartum infection (4.1% vs. 1.1%), prolonged hospitalization (4.9% vs. 1.1%) , sepsis (1.6% vs. 0.0%) and cesarean section (72.9% vs. 58.9%) were observed in obese cases as compared to overweight women. Table 2 . Significantly (p-value < 0.05) higher rates of IUFD (2.5% vs. 0.6%), low Apgar score

< 7 (30. 3% vs. 11.8%) %), admission to NICU (26. 2% vs. 12.4%) and congenital malformations (6. 3% vs. 0.0%) were observed in obese cases. The mean birth weight (2.691 ± 0.52 vs. 2.424 ± 0.212 kg, p-value < 0.05) was significantly higher in the obese group.

Table (1): Shows the nonparametric correlation between the two groups regarding demographic data and clinical characteristics

	Overweight 178		Obese 122		P value
	Count	%	Count	%	
Age in years					
<20	19	10.7%	17	13.9%	
20-30	77	43. 3%	65	53. 3%	
31 -40	66	37.1%	28	22.9%	0.142
>40	16	08.9%	12	09.9%	
Total	178	100.0%	122	100.00%	
Parity					
PG	42	23.6%	27	22.2%	
Multiparty	64	35.9%	78	63.9%	0.01*****
Grand multiparty	72	40.5%	17	13.9%	
Total	178	100.0%	122	100.0%	
GA at delivery					
<37	51	28.7%	75	61.5%	
37-40	98	55.1%	40	32.8%	0.00*
<40	29	16.2%	07	05.7%	
Total	178	100.0%	122	100.00%	
Status of booking					
Booked	120	67. 4%	81	66.4%	0.41
Un booked	58	32.6%	41	33.6%	
Total	178	100.0%	122	100.0%	

***STATISTICALLY SIGNIFICANT AT 0.05 LEVEL**

Table (2): Shows the nonparametric correlation between the two group regarding antenatal, intrapartum and postpartum maternal complications

	Overweight 178		Obese 122		P value
	Count	%	Count	%	

Ante partum complications					
Anemia	04	02.2%	10	08.2%	0.00*
Hypertensive disorders	23	12.9%	47	38.5%	0.00*
GDM	08	04.5%	12	09.8%	0.01*
Hyperemsis gravid rum	09	05.1%	11	09.1%	0.02*
Polyhydramnios	06	03.4%	08	06.6%	0.01*
DVT	00	00.0%	02	01.6%	0.02*
No complications	128	71.9%	32	26.2%	0.00*
Total	178	100.0%	122	100.0%	
Intra Partum complications					
Abruptio placentae	00	00.0%	02	01.6%	0.02*
IPH	10	05.6%	18	14.8%	0.04*
No complications	168	94.4%	102	83.6%	0.01*
Total	178	100.0%	122	100.0%	
Post Partum complications					
PPH	24	13.5%	44	36.1%	0.00*
Injury	06	03.4%	08	06.6%	0.003*
Postpartum infection	02	01.1%	05	04.1%	0.01*
Prolong hospitalization	02	01.1%	06	04.9%	0.03*
Sepsis	00	00.0%	02	01.6%	0.00*
No complications	144	80.9%	57	46.7%	0.00*
Total	178	100.0%	122	100.0%	
Mode of delivery					
SVD	56	31 .5%	22	18.0%	
IVD	17	09.6%	11	09.1%	0.01*
C/S	105	58.9%	89	72.9%	
Total	178	100.0%	122	100.00%	

***STATISTICALLY SIGNIFICANT AT 0.05 LEVEL**

Table (3**):** Shows the nonparametric correlation between the two groups regarding fetal , intrapartum and postpartum complications

	Overweight 178		Obese 122		
	Count	%	Count	%	P value
Fetal outcome					
Alive	177	99.4%	119	97.5%	0.00*
Death		00.6%	03	02.5%	0.00*

Total	01 178	100.0%	122	02.6%	
Birth weight					
Less than 2.5kg	10	05.6%	14	11.5%	0.02*
2.5-3.9 kg	102	57. 3%	76	62.3%	0.04*
> 3.9 Kg	66	37.1%	32	26.2%	0.01*
Total	178	100.0%	122	100.0%	
Apgar Score < 7 at 5 minutes					
Yes	21	11.8%	37	30. 3%	0.00*
No	157	88.2%	85	69.7%	0.001*
Total	178	100.0%	122	100.0%	
Admission to NICU					
Yes	22	12.4%	32	26.2%	0.01*
No	156	87.6%	90	73.8%	
Total	178	100.0%	122	100.00%	
Causes of Admission to NICU					
RDS	09	40.9%	13	40.6%	0.13
Birth injury	02	09.1%	02	06. 3%	
Congenital malformation	00	00.0%	02	06. 3%	
Observation	11	50.0%	15	46. 8%	
Total	22	100.0%	32	100.0%	
Outcome after NICU					
Alive	177	99.4%	119	97.5%	0.00*
Death	01	00.6%	03	02.5%	
Total	178	100.0%	122	100.0%	

***STATISTICALLY SIGNIFICANT AT 0.05 LEVEL**

Discussion

Obesity during pregnancy and postnatal are increasing in prevalence and are associated with significant long-term maternal morbidity. It has significant problems that require skill and knowledge to limit potential adverse events.

The present study aim to determine perinatal and maternal outcome in relation to maternal obesity and overweight at Bashier Teaching Hospital (From July 2021 to January 2022). A total of 178 overweight and 122 obese women delivered in the hospital during the study period were included in this study

The mean age was 31.31 ±2.88 among the overweight group , and it was 29.03 ±3.83 among the obese group with no significant difference. The mean parity was 4 ±2 among the overweight , and it was 5±2 among the obese group with a significant difference. This was similar to Hanif, et al study which compared maternal and fetal outcomes between obese and overweight pregnant women. The mean age of obese cases was 28.67±3.30 years [8]. Venini, et al evaluated maternal, delivery and neonatal outcomes in pregnancies complicated by overweight and obesity. Most women < 35 years old were overweight (22.7 %) and obese (27.6 %) [9].

Significantly (p-value < 0.05) higher rates of cesarean section (72.9% vs. 58.9%) were observed in obese cases as compared to overweight women. This was similar to the Bhushan, et al study which reported that the risk of induction of labor was highest in obese women and so was the incidence of cesarean and instrumental deliveries and the difference was statistically significant [10]. Melchor, et al assessed the effects of maternal obesity on maternal and perinatal outcomes. Compared to women of overweight (n = 9778), obese women (n = 2207) had a higher risk of preeclampsia, rectovaginal group B streptococcus colonization, induction of labor, and cesarean section [11].

The rate of preeclampsia (38.5% vs. 12.9%), anemia (8.2% vs. 2.2%) , DVT (1.6% vs. 0.0%) , polyhydramnios (6.6% vs. 3.4%) and gestational diabetes (9.8% vs. 4.5%) were significantly (p-value < 0.05) higher in obese cases as compared to overweight women. This was similar to Bhushan, et al study among overweight and obese women who showed that there is more eclampsia (5%) and gestational diabetes mellitus (6%) among obese women as compared to overweight and normal women and the difference was statistically significant in both these complications (p=0.02 for each) [10]. McCall et al reported that pregnant women with BMI>50 were slightly older, more likely to be multiparous, and have pre-existing co-morbidities. There were no maternal deaths. However, extremely obese women had a nine-fold increase in the odds of thrombotic events compared to those with a BMI < 50 [12].

Significantly (p-value < 0.05) higher rates of IUFD (2.5% vs. 0.6%), low Apgar score < 7 (30. 3% vs. 11.8%) %), admission to NICU (26. 2% vs. 12.4%) and congenital malformations (6. 3% vs. 0.0%) were observed in obese cases. The mean birth weight (2.691 ± 0.52 vs. 2.424 ± 0.212 kg, p-value < 0.05) was significantly higher in the obese group. This was similar to the Indarti, et al study which reported that there was a median gestational age of 37 weeks in all obesity grades, the highest percentage

of preterm births owned by obese II patients (32,6%), the mean birth weight of babies tends to increase along with the weighting of the body mass index group, and neonatal intensive care unit (NICU) treatment rooms were mostly occupied from mother with obese II groups (18%). There was no difference in the first-minute and five-minute APGAR scores between study groups ($P < 0.05$) [13]. Vinturache et al showed that the infants of overweight and obese women were more likely to have increased birth weight as compared to infants of normal-weight women [14]. Özalpand Mihmanlı in Turkey concluded that the weights of the babies, weight gain during the pregnancy, incidence of pre-eclampsia, incidence of SGA, and APGAR scores were found to be statistically significantly different among the groups. [15].

Conclusion

The study concluded that pregnancy outcome among obese women is associated with adverse maternal outcomes such as the development of gestational diabetes, hypertensive disorders, intrapartum hemorrhage postpartum hemorrhage, and other adverse complications compared to overweight women.

Obesity also is associated with adverse fetal outcomes like fetal overgrowth, defined as macrosomia ≥ 4000 g and increased risk of premature birth, low Apgar score, RDS and neonatal asphyxia.

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