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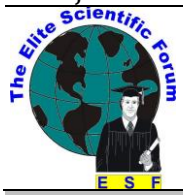

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RESEARCH ARTICLE

The Outcome of Pregnancy among Overweight and Obese Women as Compared to Normal Weight Women: A Cross-Sectional Study from Rural Sindh, Pakistan

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ABSTRACT

Obesity during birth is used as a major indicator of neonatal and maternal morbidity and mortality. The prevalence of overweight and obesity among childbearing women has increased dramatically over the past 40 years. A retrospective study was conducted in Shaikh Zayed Women Hospital, Larkana-Sindh, Pakistan. A total of 200 respondents through enrollment of 1,376 women before their 12th week of pregnancy with body mass index (BMI) till their pregnancy completed were included in the study. Group of 100 women allocated in overweight (BMI<30) and obese (BMI>30) women and compared with 100 women with normal BMI (≤24.9) group. Demographic characteristics, obstetric history and subsequent outcome of the pregnancy were recorded. Statistically significant variations were seen among obese and overweight women as compared to normal-weight women (P<0.05). Health outcomes during pregnancy like eclampsia, elite gestational diabetes, cesarean section, larger weight babies were found more in overweight (BMI 25-29.9 kg/m^2 weight in kilograms divided by height in meters squared) and obese groups (BMI>30 kg/m^2) as compared to normal-weight women. The obese and overweight group is seeking more antenatal care (ANC), Hemoglobin level and investigation as compared to normal (P<0.05). The overall fetal risk range among obese women was higher as compared to normal (P<0.05). The Study concluded a significant association of obesity during birth with certain risks of abortion and perinatal disorders.

INTRODUCTION

Numerous trials on maternal body mass index (BMI), weight gain and developmental risks have been reported in different parts of the world (Adamo et al., 2013). Throughout breastfeeding research in China found a greater incidence of pre-eclampsia, gestational diabetes mellitus (GDM), premature rupture of membranes (PROM), placental abruption and stillbirths for pregnant women with elevated BMI (Chae et al., 2016; Mercado et al., 2017; Goldstein et al., 2017). Hapsburg et al. (2019) also reported a positive correlation between maternal BMI, weight gain and developmental threats. On the other side, a US-based study identified no associations with maternal obesity and cesarean birth but reported that BMI had a significant association with a rise in pregnant women's PROM (Shen et al., 2018). Obesity is generally described in terms of BMI measured by square meters in kilograms. This formula is applied to evaluate and categorize obesity (BMI >30 but < 34.9) and morbid obesity (BMI>35). This formula is used for evaluating and classifying in four categories including normal (BMI=18.5-24.9), overweight (BMI >25 but <28.9), obesity (BMI >30 but <34.9) and severe obesity (BMI>35) (Goldstein et al., 2017).

Experiments showed that the weight gaining and maternity trends and corporeal mass indices in

developed regions with a substantial effect on the result of abortion as well as low weight gain (Kordi et al., 2017). In most pregnant women, the weight gain is not considered too low or too high in comparison to present standards recommended by the National Center for Health Statistics (NCHS), Centers for Disease Control and Prevention, United (Flegal et al., 2012). Moreover, information on weight gaining patterns is limited in pregnant women of developing countries. Hence, this research was conducted to evaluate the outcome of pregnancy among overweight women with a BMI of more than 30 as compared to normal in a rural hospital of Larkana, Sindh, Pakistan.

MATERIALS AND METHODS

A cross-sectional descriptive study was conducted in Shaikh Zayed Women Hospital, Larkana, Pakistan between 2017 to 2019. The research covered pregnant women who met the inclusion criteria. This included women aged between 18-35 years and gestation of less than 12 weeks. Those who were suffering from medical problems viz. blood pressure, renal disorders and diabetes mellitus (who were not following the management of diabetes mellitus guidelines by the American Diabetes Association for prenatal therapy) were excluded from the study. A total of 224 females were excluded from 1,600 qualifying respondents. Eventually, a total of 1376 pregnant females were included in the study. Finally, 200 women (100 each with overweight and normal weight) were included and allocated into two groups. Checklists comprising three aspects of demography, obstetrical background and birth results have been used to gather data and both types of patients were tracked before birth. On the first prenatal assessment, the height and weight of pregnant females were measured followed by the calculation of BMI. The comparison category was chosen for a population of a typical range of BMI (20 BMI for 24.9 kg/m^2). Obstetric findings included pre-eclampsia, pre-emption mode of birth (spontaneous virginals, instrumental or cesarean), pre-emption of placenta previa and abruption placenta. Perinatal outcomes were calculated by subtracting the second figure from the first, including the risk of mortality and the birth weight, and the overall number of C-sections and emergency C-sections. Additionally, gestational age (GA) was reported using the database and checked by ultrasonography according to the last menstrual cycle of the subjects. A well-designed questionnaire was used for the assessment of socio-demographic female data including gender, age, income, employment status and the history of woman's health. The portogram was used to gather details of the development of childbirth, motherhood, childbirth and fetal health. The neonatal assessment involved 1st- and 5th-minute review of the Apgar score and prompt neonatal treatment. The Committee on Ethics and Authority of the Shaikh Zayed Women Hospital, Larkana approved this research and written informed consent was obtained from each participant. SPSS version 22 was used for statistical analysis of the results and analysis was performed by using analysis of variance (ANOVA) and Mann-Whitney for constant variables whereas analysis of categorical variables was performed using the Chi-square test. The statistically significant value of a $P<0.05$ was assessed and the potential cofounders for logistic regression were controlled. A raw and balanced odds ratio (OR) of 95 percent confidence intervals (CI) was defined as the possibility of obstetrical complications.

RESULTS

Results revealed a significant correlation ($P <0.05$) of education and profession among women with BMI >30 as compared to those with <24.9. However, age was recorded as a non-significant factor (Table 1).

Results showed the median gestational age was (32.5±5.3) of both groups. There were significant differences in the use of antenatal care (ANC), hemoglobin (Hb) level and investigation performed in the groups. However, gestational age and initiation of ANC among these groups were found non-significant (Table 2).

Table 1: Basic information of women with BMI >30 and ≤24.9

Variables	Values	Women with BMI>30 (n=100)		Women with BMI ≤24.9 (n=100)		Test used	
		N	%	N	%	χ^2	P-value
Age (years)	<25	20	20	14	14	2.87	0.24
	25- <30	34	34	45	45		
	30- ≥35	46	46	41	41		
Education	Illiterate	22	22	18	18	9.48	0.02
	Basic	26	26	36	36		
	Secondary	42	42	45	45		
	University	10	10	1	1		
Profession	Working	40	40	27	27	3.79	0.05
	Housewife	60	60	73	73		

(*) Statistically significant at P<0.05

Table 2: Comparison of different variables of women with BMI >30 and ≤24.9

Variables		Women with BMI>30 (n=100)		Women with BMI ≤24.9 (n=100)		Test used	
		N	%	N	%	χ^2	P-value
Gestational age (weeks)	Range	27.60- 40.20		27.60- 40.20		t=1.610	0.108
	Mean+SD	32.56±5.35		31.21±6.46			
Number of ANC visits:	None	17	17	9	9	17.100	0.002*
	1-2	36	36	19	19		
	3-5	24	24	46	46		
	6-8	12	12	19	19		
	9+	11	11	7	7		
		n=83		n=91			
Initiation of ANC	1st trimester	9	10.84	10	10.99	0.016	0.992
	2nd trimester	40	48.19	43	47.25		
	3rd trimester	34	40.96	38	41.76		
Investigations done	Sugar in urine	30	30	13	13	8.742	0.013
	Protein in urine	37	37	43	43		
	Rh factor	33	33	44	44		
Hemoglobin level	Range	8.50-13.20		7.50-13.50		t=1.922	0.056
	Mean±SD	11.10±1.20		10.70±1.70			

(*) Statistically significant at P<(0.05). (@) For attendants of ANC

Table 3: Factors associated with postnatal maternal and fetal risks of women with BMI >30 and ≤24.9

Variables	Women with BMI>30 (n=100)		Women with BMI ≤24.9 (n=100)		Test used	
	N	%	N	%	χ^2	P-value
		Maternal				
GDM	15	15	2	2	10.865	0.001
P1H	10	10	4	4	2.765	0.096
Post-date	15	15.	3	3	8.791	0.003*
Obstructed labor	17	17	5	5	7.354	0.007
Assisted labor	30	30	7	7	17.543	0.000*
Caesarean section	20	20	5	5	10.286	0.001*
Increased blood loss	10	10	2	2	5.674	0.017
Prolonged operative time	10	10	3	3	4.031	0.045
Total of maternal risk Range (median)	4-8(6)		1-3(2)		Z=4.123	0.020*
		Fetal				
Macrosomia	18	18	2	2	14.222	0.000*
IUGR	10	10	5	5	11.060	0.001*
Shoulder dystochia	11	11	3	3	0.053	0.818
Acceleration	22	22	2	2	18.939	0.000*
Deceleration	30	30	6	6	67.894	0.000*
Birth trauma	4	4.00	5	5.00	47.040	0.000*
Total of fatal risk Range (median)	3-7(5)		1-4(2)		Z=7.581	0.000*

(*) Statistically significant at P<0.05.

Table 4: Maternal and Fetal postnatal complications and disorders of women with BMI >30 and ≤24.9

Variables	Women with BMI>30 (n=100)		Women with BMI ≤24.9 (n=100)		Test used	
	N	%	N	%	χ^2	P-value
		Maternal				
Postpartum haemorrhage	10	10.00	2	2.00	5.674	0.017
Thromboembolism	5	5.00	0	0.00	5.128	0.024
Wound infection	15	15.00	0	0.00	16.216	0.000*
Prolonged hospitalization	20	20.00	0	0.00	22.222	0.000*
Laceration	20	20.00	10	10.00	3.922	0.048
Deep venous thrombus	4	4.00	1	1.00	1.846	0.174
Total of maternal risk Range (median)	3-6(5)		1-2(1)		Z=8.489	0.000*
		Fetal				
Low birth weight	10	10.00	5	5.00	1.802	0.179
Overweight	20	20.00	3	3.00	14.198	0.000*
Low Apgar score	40	40.00	4	4.00	37.762	0.000*
Congenital anomalies	1	1.00	0	0.00	1.005	0.316
Stillbirth	2	2.00	0	0.00	2.020	0.155
Total of fatal risk Range (median)	3-5(4)		1-3(2)		Z=3.65	0.030*

(*) Statistically significant at P<0.05.

A significant difference was observed in gestational GDM and post-date labor and there was no statistical difference seen in pregnancy-induced hypertension (PIH) risk, impaired work, increased blood losses and prolonged delivery times between the two groups. No major variations on the two groups occurred except for shoulder dystocia (P=0.818) (Table 3). The overall fetal risk range for females with BMI>30 is higher (range=4-9, average=7) compared to fetal for women with BMI>25 (P=0.00).

Results of the study showed that wound infections (P<0.000) and protracted hospitalizations (P<0.000) were statistically significant in maternal postnatal problems of females with BMI>30 as compared to those with BMI<24.9 (Table 4). There were no statistically significant differences between the two groups of postpartum hemorrhage, thromboembolism, lacerations and deep venous thrombus (DVT). For postnatal fetal problems, the results indicated significant differences in overweight and low Apgar score (P≤0.00).

DISCUSSION

In this study, overweight women were found with more serious outcomes of pregnancy as compared to normal-weight women. In previous studies, it had been proved that obesity is an increasing concern in pregnancy and influenced morbidity, mortality and a dramatically higher cost of antenatal and intranet treatment (Gomez-Arango et al., 2016). Higher prenatal and post-natal health treatment in average than usual people for obese mothers and need difficulties in normal deliveries had also been reported (Nnoli et al., 2018). The usage of antenatal treatment of women with BMI<30 was low in the current research as compared to normal-weight women, they have had fewer visits; thus, their follow-up of antenatal treatment was poor. The findings of the current study are supportive of several previous studies (Poston et al., 2016; Shen et al., 2018; Chen et al., 2018).

Concerning maternal issues, the findings of this research showed that the numbers of actual perinatal risks for pregnant women with BMI>30 were statistically higher. These findings are in line with the findings of Nahum et al. (2016) who reported a higher level of likelihood of maternal and fetal adverse effects in obese and morbidly obese females. Besides, the increased BMI of pregnancy outcomes of nulliparous women with singleton babies had also been studied (Saraswat et al., 2017). The greatest incidence of inducing labor was reported to the overweight obese women, with the lowest emergency Cesarean rate. Bleeding and early discharge was even more probable.

As with fetal outcomes, in females with BMI>30 a longitudinal substantially greater degree was reported in perinatal or natal issues, such as macrosomia, pause in uterine development, acceleration, deceleration and birth trauma. However, there was no significant disparity in shoulder dystocia between the two classes. The results are also in line with the findings of Kumari and Singh (2017), who conducted a study on morbid obesity effects on work. The outcomes of the study, including; cesarean section, microsome and Birth trauma were substantially related to non-obese people than in morbid-women (Pasko et al., 2019), who observed that the depressed obese woman group had a greater risk of post-dated children, agreed with the previous findings of this research.

In the current study, maternal postnatal problems such as wound infection and prolonged stay for females with BMI>30 community were statistically significant. Results were supportive of a similar study by Goldstein et al. (2017) who reported a higher risk of injury and infection among obese people. However, they observed higher rates of postpartum hemorrhage and deep venous thrombophlebitis in obese workers, in contrast with the current research.

In women with a BMI>30 group, most women and newborns had postpartum problems. These results are consistent with a previous study by Poston et al. (2016) who demonstrated a positive association of maternal obesity with various maternal and fetal complications. The results support the causal relationship between obesity and the risk of adverse pregnancy outcomes of the same lines as reported by Nnoli et al. (2018). In conclusion, the adverse outcomes of pregnancy in obese women are higher as compared to normal-weight women. However, proper counseling for weight control should be provided during antenatal counseling that could reduce fetal and maternal complications related to obesity.

Authors' Contributions

SP and SH developed the study design. P S, MAS and KZ participated in data collection and analyzed the data. NK and RK drafted the manuscript. RS provided feedback and revised the manuscript. All the authors read and agreed with the information provided in the final version of the manuscript for publication.

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