



OBESE PRIMIGRAVID WOMEN; FREQUENCY OF MACROSOMIA

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ABSTRACT... Objectives: To determine the frequency of macrosomia in obese primigravid women. **Study Design:** Case series study. **Period:** Six months. **Setting:** Department of Gynecology and Obstetrics Department Jamshoro. **Patients and Methods:** The inclusion criteria of the study were primigravida women between age 18 to 35 years with singleton pregnancy and gestational duration of 37 to 42 weeks, and during labour with BMI 30 or >30kg/m² and All booked women who were primigravid during antenatal visit try to come and BMI calculated by weight in kg and height in meter square. The variables include post-delivery if the weight of baby is 4.5 kg is macrosomic and mode of the delivery. The data was analyzed in SPSS version 17, the frequency and percentage was calculated while the chi-square test was applied on categorical variables and the p-value ≤0.05 was considered as significant. **Results:** During six months study period total 203 pregnant obese ladies were observed for macrosomic babies. Age group was analyzed which shows that in age group between 18-25 years were 105(52.00%) women, in age group of 26-30 years were 62 (30.69%) women and age group of 30 years and above were 35 (17.31%) women with mean age ± SD of ladies was 24.6 ±6.2 years. Regarding modes of delivery shown 132 (65.02%) ladies had C-section and 71 (34.97%) ladies had vaginally delivery. Weight of the babies was assessed which shows 27 (13%) were born with less than 2.5 Kg, babies having weight between 2.6-3 Kg were 71 (35.3%) , babies were having weight 3 kg to 4.5kg 38 (18.7%) and babies having more than 4.5kg which shows 67 (33%). Neonatal complications observed were macrosomic babies 67 (33.1%). Frequency of macrosomic babies was higher in women with BMI more than 3.5kg/m² 44(21.67%) and in women with BMI between 30 to 35kg/m² 25(12.31%). **Conclusion:** Obesity responsible for complications during pregnancy and delivery for both mother and babies. Fetal complications are macrosomia and these obese ladies should motivate for maintenance of weight.

Key words: Macrosomia, Obesity, Primigravid.

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INTRODUCTION

The pre pregnancy BMI is a major predictor of birth weight with maternal obesity having an increased rate for delivering large for date babies.¹ Former studies had reported that the obese mother is 1.4-18 times more likely to give birth to a large for date infant.^{2,3} Macrosomia (babies with an excessive birth weight) leads to the risk of brain injury, shoulder dystocia, low apgar scores and perinatal death.⁴ A study examined the mode of delivery of infants weighing > 4kg shown the incidence of C-section among the macrosomic babies was 25.8% as compared with 13.1% in general population.⁵ The reported incidence for shoulder dystocia was 7.6% which can

leads to Erb's palsy common complication with macrosomic babies.⁶ The babies born to obese mothers needs more admissions to neonatal intensive care (NICU) unit for proper evaluation, monitoring and management.⁷ In a study conducted in France, the frequency of infants need admission in a NICU was 3.5 times higher in obese mothers.⁸ Maternal obesity has increased risk for stillbirth and neonatal death as compared to normal weight mothers. The stillbirths is due to intrauterine death and impairment of fetoplacental process among obese pregnant women as compared with normal weight ladies.⁹ Excessive growth of the fetus is a main contributor to adverse obstetrical outcomes¹⁰,

Khashu et al. examined the perinatal outcomes of 1842 macrosomic newborns in British Columbia, and Canada and observed significantly increased maternal risks of emergency Caesarean section, postpartum hemorrhage, obstetrical trauma and maternal diabetes.¹¹

Maternal obesity contributes to macrosomia via mechanisms including increased insulin resistance resulting in increase fetal insulin and glucose levels.¹² Placental lipases metabolize triglycerides in maternal blood, allowing free fatty acids to be transferred in excess to the growing fetus.¹³ Factors associated with fetal macrosomia include duration of gestation, genetics, diabetes mellitus and existence of gestational diabetes. Genetic, ethnic, racial factors influence birth weight and the risk of macrosomia.¹⁴

Therefore, by considering such theme in mind the present study was conducted in the department of gynecology and obstetrics at Liaquat University Hospital Jamshoro. The study will explore the frequency of macrosomia in obese primigravid women so the proper workup and management strategies can be planned according to the results of the present study.

PATIENTS AND METHODS

This case series study of six months was conducted in the department of gynecology and obstetrics department Jamshoro. The inclusion criteria of the study were primigravida women between age 18 to 35 years with singleton pregnancy and gestational duration of 37 to 42 weeks, and during labour with BMI 30 or $>30\text{kg/m}^2$ and All booked women who were primigravid during antenatal visit try to come and BMI calculated by weight in kg and height in meter square while exclusion criteria were obese multigravid women and pregnant women with diabetes mellitus, hypertension or any other chronic metabolic or infectious disease. The macrosomic infants were considered when infant weight more than 4.5 kg at birth. The informed consent was taken while the data was collected on pre-designed proforma. The variables include

post-delivery if the weight of baby is 4.5 kg is macrosomic and mode of the delivery. The data was analyzed in SPSS version 17, the frequency and percentage was calculated, effect modifier like age, gestational age, and BMI was entered and addressed by stratifications while the chi-square test was applied on categorical variables and the p-value ≤ 0.05 was considered as significant.

RESULTS

During six months study period total 203 pregnant obese ladies were observed for macrosomic babies. Age group was analyzed which shows that in age group between 18-25 years were 105(52.00%) women, in age group of 26-30 years were 62 (30.69%) women and age group of 30 years and above were 35 (17.31%) women with mean age \pm SD of ladies was 24.6 ± 6.2 years. Regarding modes of delivery shown 132 (65.02%) ladies had C-section and 71 (34.97%) ladies had vaginally delivery. Weight of the babies was assessed which shows 27 (13%) were born with less than 2.5 Kg, babies having weight between 2.6-3 Kg were 71 (35.3%), babies were having weight 3 kg to 4.5kg 38 (18.7%) and babies having more than 4.5kg which shows 67 (33%) shown in Table-I. Neonatal complications observed were macrosomic babies 67 (33.1%). Frequency of macrosomic babies was higher in women with BMI more than 3.5kg/m^2 44(21.67%) and in women with BMI between 30 to 35kg/m^2 25(12.31%). The macrosomic complication, with regards to age group in 18 to 25 years 31, 25 to 30 years 19, and more than 30 years 17. C-section complication with regards to age group is 57 in 18 to 25 years, 34 were 25 to 30 years, and 41 in more than 30 years. Macrosomic with regards to gestational age is 11 in 18 to 25 years, 12 between 25 to 30 years and 8 if more than 30 years. C-section complication with regarding to gestational age is 35 in 18 to 25, 51 were in 25 to 30 years and 46 were in age more than 30 years. The stratification of complications regarding BMI, maternal and gestational age are mentioned in Table-II-IV.

Weight of Baby (KG)	Frequency	Percent
≤2.5	27	13
2.5-3	71	35.3
3.00-4.5	38	18.7
Macrosomic >4.5	67	33
Total	203	100

Table-I. Weight of new born baby

Complications	Total	BMI (30-35Kg/m ² n(%))	BMI (≥35Kg/m ² n(%))	P - value
C-Section	132 (65.02%)	60(29.7)	72(35.46)	0.041
NVD	71 (34.97%)	26(12.8)	45(22.1)	0.003
Macrosomic	67 (33.1)	25(12.5)	44(21.67)	0.032

Table-II. Stratification of variables with regard to BMI

Complications	Age Groups (years)			P-value
	18-25	25-30	> 30	
C-Section	57	34	41	0.07
Macrosomic	31	19	17	0.041

Table-III. Stratification of variables with regard to age group

Complications	Gestational age (weeks)			P-value
	18 to 25	25-30	> 30	
C-Section	35	51	46	0.063
Macrosomic	11	12	8	0.025

Table-IV. Stratification of variables with regard to gestational age

DISCUSSION

In comparison to Sridhar SB, etal¹⁵ neonatal outcomes on gestational weight gain in morbidly obese (BMI≥40.00) ladies, this study shown that 30.6% of ladies gained the recommended amount of weight during pregnancy while 52.3% of ladies gained more than recommendations whereas 17.1% acquired less than recommended. In ladies with normal pre-pregnancy weight, excess weight associated with risk for increase duration of labour, pregnancy induced hypertension and birth weight ≥4000 g as obesity is associated with increased risk for hypertension and birth weight. Obstetric and perinatal outcomes were also studied, the obese women are at risk for pre-eclampsia and gestational diabetes mellitus and in such subjects the rate of caesarean section

rate is high. It has also been reported that the rate of in-utero fetal death, neonatal mortality was significantly higher in the obese women and the high BMI also a predictor for gestational diabetes and eclampsia. Many theories has been stated regarding the association of pre-eclampsia and dyslipidemia (weight gain), abnormality in prostaglandin functions causes arteriolar constriction and are responsible for in-utero fetal deaths in obese women, also probably due to placental dysfunction related to weight gain itself. It has been observed that the dyslipidemia in obesity increases peroxidase formation, leads to vasoconstriction and aggregation of platelet and thus impairs perfusion for placenta. Babies of obese mothers are most likely to be large for gestational age (LGA) and macrosomic in comparison to normal weight pregnant ladies. The higher rate in this study might be due to quality of study population and this is tertiary care public governmental hospital received the referral cases from urban as well remote peripheral areas of province in emergency. In present study the macrosomia was observed in 33% babies while in the study by Gaudet L, et al² it was 22.4% and majority of the ladies underwent C-section while in the Saudi Arabian study prevalence of fetal macrosomia was 4.5%.¹⁶ The macrosomia was mostly observed in mothers of 30+ age had 25-30 weeks of gestation with statistical significant and the findings are also consistent with the study by Leddy MA, et al respectively.¹⁷

The result was comparable with the study conducted by Ehrenberg et al. in 2004 in Ohio, US, that found that the prevalence of macrosomia was 11.8% of population sample.¹⁸ The incidence of macrosomia also was confirmed to be approximately 7%-10%.¹⁹ The newborns that were 4.5 kg or heavier constituted 1-2% of all of the newborns.²⁰ The incidence of macrosomia was reported as 9.8% in a study conducted in Turkey.²¹ However, the rate was determined as 5.8% in the study by Hajy-Ebrahim-Tehrani et al. in Iran.²² There are many studies reporting that the history of a pervious macrosomic baby is the most common leading maternal factor to macrosomia.^{23,24}

No intervention has been proven to reduce the macrosomic risk, although several useful strategies are supportive including strict glycemic control during pregnancy by diet and insulin, prevention of maternal obesity during pregnancy and the rate of perinatal and maternal morbidity can be reduced by antenatal diagnosis.²⁵ The risk factors for macrosomia should be thoroughly assessed by the clinician because majority of factors are preventable, and with good cooperation of gynecologists, pediatricians and dieticians along with maternal training and counseling, the number of such incidences can be minimized.²⁶

CONCLUSION

Obesity is responsible for complications during pregnancy and delivery for both mother and babies. Fetal complications are macrosomia and these obese ladies should be motivated for weight loss and maintenance and taking preventive measures for excessive weight gain during pregnancy. Such plan leads to decreases in complication rate and this strategy should begin during preconception period.

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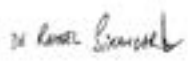
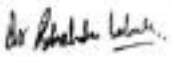
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AUTHORSHIP AND CONTRIBUTION DECLARATION

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2	Dr. Rabail Rani Junejo	Analysis and interpretaion of data controbuted in conception and shares its expert research opinion.	
3	Prof. Raheel Sikandar	Drafting the article and shares its expert research opinion and experience in finalizing the manuscript.	
4	Dr. Shahla Baloch	Contributed in conception and interpretation of data and give his expert view for manuscript designing.	
5	Dr. Mehrunnisa Khaskheli	Drafting the article and shares its expert research opinion	