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Research Article

**FETO-MATERNAL RISK FACTOR ASSOCIATED TO THE  
MODERATELY AND EXTREMELY OBESE PREGNANT  
WOMAN IN COMPARISON TO THE NORMAL WEIGHTED  
PREGNANT CASES (PRIMIGRAVIDA AND MULTIGRAVIDA  
CASES): A COMPARATIVE COHORT RESEARCH****Dr. Shahpara Alamgir, Dr. Ayesha Rehman, Dr. Muzzamil Riaz**

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**Abstract:**

**Objective:** The comparison of the adverse Feto-maternal outcomes in both the groups of Normal and overweight pregnant woman was the objective of this particular research.

**Methods:** Design of the research was comparative cohort, which was completed in the time span of November, 2016 to October, 2018 (Mayo Hospital, Lahore) on a sample of 200 gravid ladies. Sample was divided into two main groups named as overweight and normal pregnant women of hundred cases each. Sample was comprised of pregnant women having gestational age in the range of 08 weeks – 40 weeks. Overweight and normal cases were categorized respectively as (BMI 25 – 29.9 Kg/m<sup>2</sup>) and (BMI of 18.5 – 24.9), normal cases were taken as controls. Feto-maternal outcomes were compared through Chi-square test and the p-value was taken as (< 0.05).

**Results:** Women selected for the research were in the age bracket of 30 – 45 years with a mean age of (30 ± 4.1 years). High frequency of pre-eclampsia was observed in overweight women in comparison to the normal group (27% vs 9%), gestational diabetes mellitus (DM) (22% vs 5%), PIH (24% vs 8%), Caesarean section (44% vs 16%), prolonged labor (4% vs 6%), Postpartum Hemorrhage (5% vs 2%) and Wound infection (3% vs 2%). The significant P-value was taken as (< 0.001). In terms of fetal complications in both the groups when compared were as Early neonatal death (11% vs 1%), Still birth (13% vs 2%), NICU admission (47% vs 10%) and shoulder dystocia (5% vs 1%). Except the incidence of shoulder dystocia outcomes were statistically significant.

**Conclusion:** It is concluded that deleterious effects are related to the incidence of obesity on the Feto-maternal outcomes.

**Key Words:** Outcomes, Controls, Pregnant Overweight Women and Adverse Feto-maternal.

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**INTRODUCTION:**

All over the globe obesity is graded among the most prevalent chronic medical condition [1]. Various populations have varying prevalence's of the obesity which purely depends on sex and age. This incidence is at rise in the pregnant women, which causes complications associated to the pregnancy affecting mothers and fetus [3, 4]. Miscarriage and conception related issues are linked with the incidence of obesity in the women along with congenital anomalies which decrease the fertility response [5]. Other associated complications are gestational diabetes, cesarean delivery, pregnancy induced hypertension, infections and macrosomia (Asadullah Makhdoom et al) [6].

According to WHO, underweight, normal weight and overweight are categorized on the basis of BMI respectively  $< 18.5$ ,  $18.5 - 24.9$  and  $25 - 29.9$ ; where, obesity is referred to a BMI above 30. Obesity is further divided in to three main categories such as Class I, II and III respectively a BMI value of ( $30 - 34.9$ ), ( $35-39.9$ ) and (Above 40).

BMI is internationally accepted measurement of the obesity or it can be measured through Quetelet index [9, 10]. An obstetric issue is maternal obesity linked with the obesity in the period of pre-gravid which is an excessive gain of weight in the time of pregnancy [11]. Weight gain can be defined as the pre-pregnancy and labor time weight is weight gain in the duration of pregnancy. Pakistan is no exception to this issue because of an inactive lifestyle, fat rich diet and irregular eating patterns. The comparison of the adverse Feto-maternal outcomes in both the groups of Normal and overweight pregnant woman was the objective of this particular research.

**METHODS:**

Design of the research was comparative cohort, which was completed in the time span of November, 2016 to October, 2018 on a sample of 200 gravid ladies. Sample was divided into two main groups named as overweight and normal pregnant women of hundred cases each. Sample was comprised of pregnant women having gestational age in the range of 08 weeks – 40 weeks. Overweight and normal cases were categorized respectively as (BMI  $25 - 29.9$  Kg/m<sup>2</sup>) and (BMI of  $18.5 - 24.9$ ), normal cases were taken as controls. Feto-maternal outcomes were compared through Chi-square test and the p-value

was taken as ( $< 0.05$ ). Sample size was calculated through a software (Raosoft) with a proportion of (25%), which were selected out of the obstetrical admissions keeping (CI as 90%) and (Error margin 10%). Informed consent was taken from the selected sample of the research, which was selected among the 3090 cases of obstetrical admissions. Non-probability purposive consecutive sampling method was used in this research. We included singleton pregnant cases in the gestational age of (08 weeks – 40 weeks). All the cases of medical disorder history such as thyroid, diabetes mellitus (DM), renal, adrenal disorders and T2DM. In the list of demographic variables BMI, age and height were included. BMI was measured in (weight in kilograms) and height in (kg/m<sup>2</sup>).

Every participant was not included as there were few cases drop-out cases, follow-up loss and non-consent cases which restricted the sample to 200 cases which was divided into two groups.

An assessment of the clinical examination, medical history and regular investigation was also carried out in all the pregnant women. The observed outcomes were observed as preeclampsia, gestational diabetes mellitus (DM), pregnancy induced hypertension, wound infection, caesarean section, labor complications such as PPH and prolonged labor and fetal were early neonatal death, still birth, NICU admission, fetal trauma and shoulder Dystocia.

A Performa was used for the documentation of the age, gestational age, parity, Feto-maternal complication and BMI. Results were shown in graphs and tables.

Hospital ethical consent and patient's informed consent was taken before the commencement of the research. SPSS and Chi-Square test were used for the data analysis with a significant P-value of ( $< 0.05$ ).

**RESULTS:**

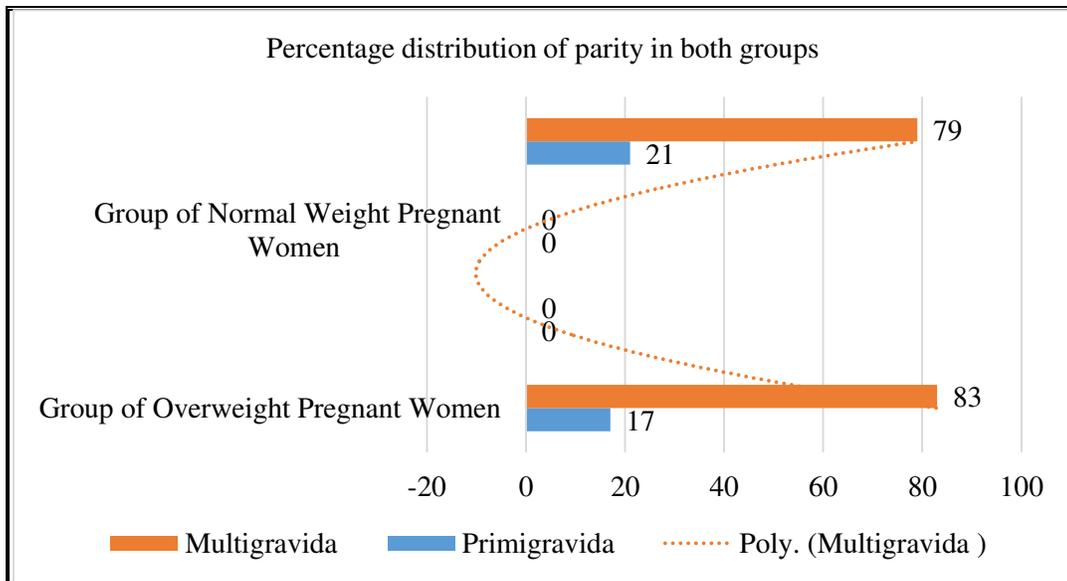
Women selected for the research were in the age bracket of 30 – 45 years with a mean age of ( $30 \pm 4.1$  years). High frequency of pre-eclampsia was observed in overweight women in comparison to the normal group (27% vs 9%), gestational diabetes mellitus (DM) (22% vs 5%), PIH (24% vs 8%), Caesarean section (44% vs 16%), prolonged labor

(4% vs 6%), Postpartum Hemorrhage (5% vs 2%) and Wound infection (3% vs 2%). The significant P-value was taken as ( $< 0.001$ ). In terms of fetal complications in both the groups when compared were as Early neonatal death (11% vs 1%), Still birth (13% vs 2%), NICU admission (47% vs 10%) and

shoulder dystocia (5% vs 1%). Except the incidence of shoulder dystocia outcomes were statistically significant. Overweight cases were 266 (8.6%); whereas, only hundred cases were enrolled in the research study to compare and contrast with the control group.

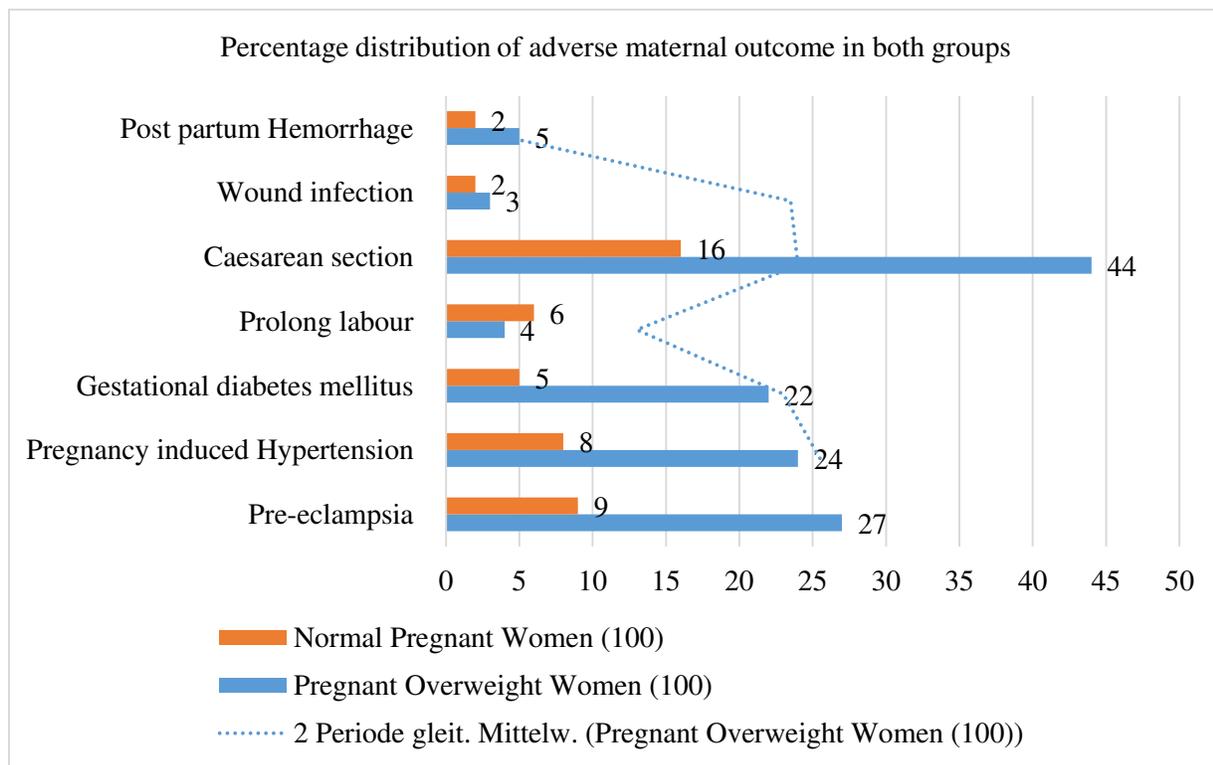
**Table – I: Percentage distribution of parity in both groups**

Parity	Group of Overweight Pregnant Women		Group of Normal Weight Pregnant Women	
	Number	Percentage	Number	Percentage
Primigravida	17	17	21	21
Multigravida	83	83	79	79
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>



**Table – II: Percentage distribution of adverse maternal outcome in both groups.**

Maternal Outcome (100)	Pregnant Overweight Women (100)	Normal Pregnant Women (100)	P-Value
Pre-eclampsia	27	9	0.0096
Pregnancy induced Hypertension	24	8	0.0146
Gestational diabetes mellitus	22	5	0.0041
Prolong labor	4	6	0.7694
Caesarean section	44	16	0.0024
Wound infection	3	2	0.9912
Post-partum Hemorrhage	5	2	0.4653



The age was in the limit of 30 – 45 years with a mean age of (30 ± 4.1) years for both groups. Table – I shows the parity distribution, percentage of both groups with a same multigravida and primigravida frequency.

Table – II shows the overweight maternal outcomes with the common most incidence of pre-eclampsia as most of the cases were of caesarean section that made the outcomes even adverse. Similarly, prolonged labor, pregnancy induced hypertension and caesarean

section were more observed in the overweight pregnant cases. However, postpartum hemorrhage and wound infection frequency was also same in Group A & B. Overweight pregnant women faced fetal complications such as an early neonatal death, stillbirth and NICU admission than controls. Table – III shows the comparison of the Feto-maternal outcomes.

**DISCUSSION:**

Critical complication has been faced by healthcare in the management of the obese pregnant women which is a threat to the maternal and fetus health [12]. Recently a research was carried out in USA which identified that overweight cases in the age of twenty-five years are (28%), among these cases critical cases are (27%) [13]. In terms of difference overweight frequency, obese and morbidly obese are respectively 33%, 30% and 4.5% [14].

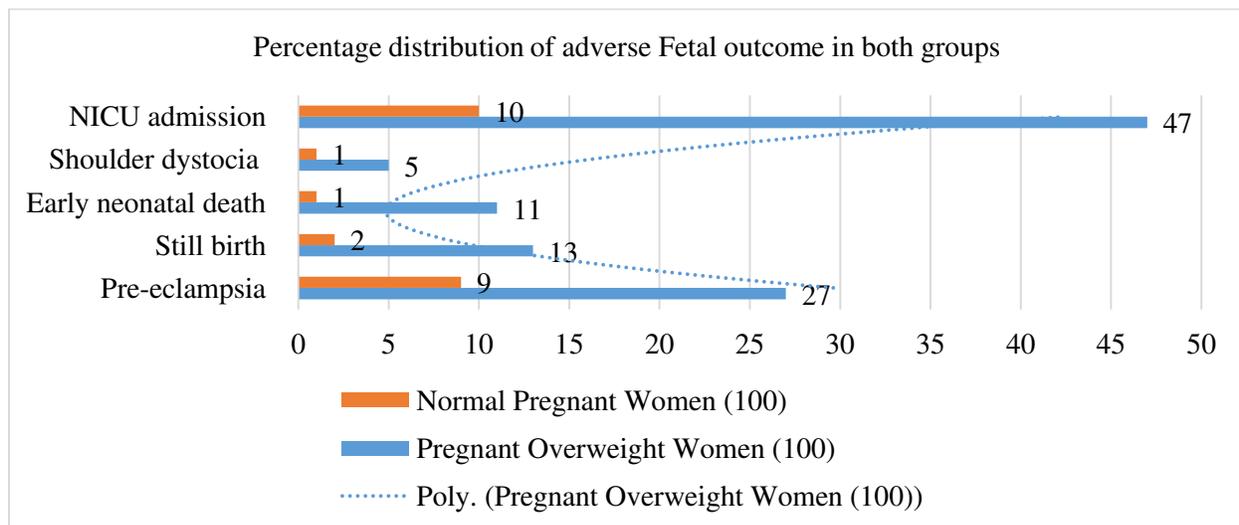
We included in our research primigravida and multigravida cases respectively as 17% & 83% which can be compared with the outcomes of research conducted by Chaudhry H et al [15]. Humaira conducted her research on primigravida (30%) and multigravidas (70%) were included in the research [15].

Difference in the factor of mean age was compatible with the research of Fatima ( $30 \pm SD 4.1$  Vs 26.4 Years) [16].

Pre-eclampsia was associated with the increased rate of maternal BMI. The rate of risk was higher in the pre-eclampsia pregnant cases observed as (35%) in the BMI range of (15 – 21). Additionally, this risk has a chance of being doubled if the BMI in the range of (26 – 30.17). Inflammation hypothesis & Hyperlipidemia have also an association with the relative preeclampsia (BMI) [18]. Serious risks are associated with the Hyperlipidemia and elevated BMI rate that cause preeclampsia as a serious threat, Obesity is also associated with the Hyperlipidemia.

**Table – III:** Percentage distribution of adverse Fetal outcome in both groups

Fetal Outcome	Pregnant Overweight Women (100)	Normal Pregnant Women (100)	P-Value
Pre-eclampsia	27	9	0.0096
Still birth	13	2	0.0133
Early neonatal death	11	1	0.0121
Shoulder dystocia	5	1	0.2321
NICU admission	47	10	< 0.0001



It is significant in this research that hypertension related linked to obesity were (24%); whereas, normal weight cases it was observed as (8%) ( $p = 0.0146$ ), which is same as observed by Asadullah Makhdoom et al [22].

In the extremely overweight cases there is extreme risk of the prolonged labor which is considered as repeated risk in the practice of obstetrics. Identified complication in our research are (4%) prolong labor in overweight cases; whereas, in the normal cases as (6%) ( $p = 0.7694$ ) which is in contrast to the research of Arrowsmith S et al. as he observed this rate as thirty percent in the obese cases [20].

According to the research carried out by Hibbard in the caesarian section (44%) and (16%) respectively in the overweight and normal weight cases [22]; whereas, according to the research carried out by Ngoga, Caesarian section cases were reported as (35%) [23]. There is an increased risk of the occurrence of the Post-Partum Hemorrhage occurrence in obese cases as forwarded by numerous research studies, Post-Partum hemorrhage cases as (24.5%) because of overweight and normal weight cases as (2%) as observed in our research.

It was observed as outcomes of our research that in the pregnant women (100 overweight cases) (13%) still births in the group of overweight and in normal weight cases as (2%) ( $p = 0.0133$ ); these outcomes can be compared with the outcomes of Fatima where it was observed as (8%) [16]. Overweight cases were observed with (11%) early neonatal deaths in the obese cases; whereas, in the normal cases it was observed as (1%) ( $p = 0.0121$ ). Overweight cases were identified Fetal Trauma (5%) and in the normal cases (1%) ( $p = 0.2321$ ). NICU admissions in the overweight and normal cases were respectively 47% and 10% ( $p\text{-value} = < 0.0001$ ).

### CONCLUSION:

Outcomes can be adversely affected in the moderate overweight cases in terms of the pregnancy outcomes as obesity causes fetal and maternal complications. Morbidly obese cases were treated in the high-risk category of the pregnant cases. We need to prepare for the prevention of the obesity specially during pregnancy as it has numerous associated complications. Weight loss programs are to be

encouraged. Management of the obesity can reduce these complications through a multidisciplinary approach. It is concluded that deleterious effects are related to the incidence of obesity on the Feto-maternal outcomes.

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