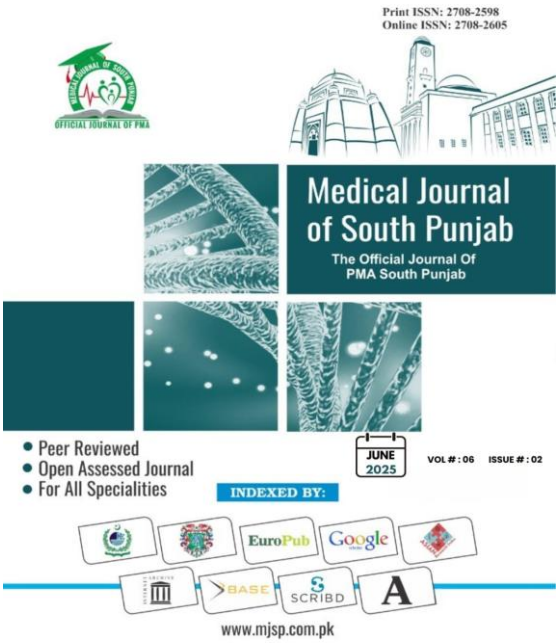
ISSN (E): 2708-2601
ISSN (P): 2708-2598

Medical Journal of South Punjab
Article DOI:10.61581/MJSP.VOL06/02/05

Volume 5, Issue 4, 2024



Increase in Vessel Luminal Diameter after Rotational Atherectomy: A study from Multan Institute of Cardiology, Pakistan

Publication History

Received: Oct 03, 2024 Revised: Nov 15, 2024
Accepted: Nov 29, 2024 Published: Dec 30, 2024

Authors and Affiliation:

Syeda Zainab Gillani[1], Nida[2], Lubna Noor[3], Maryam Arif[4], Sadia Majeed[5], Najia Kasi[6]

[1-6]Combined Military Hospital, Multan, Pakistan.

[*]**Corresponding Author Email**: zaynab.gillani@gmail.com

Conflict of Interest:

Author(s) declared no conflict of interest.

Acknowledgment:

No Funding received.

Citation: Rasheed M, Gill BUA, Farid MI, Sherwani M, Fareed MS, Khan MA. Increase in Vessel Luminal Diameter after Rotational Atherectomy: A study from Multan Institute of Cardiology, Pakistan. Medical Journal of South Punjab. 2025 June 30; 6(2):42-47.

Please scan me to access online.

An official publication of
Medteach Private Limited, Multan, Pakistan.
Email: farman@mjsp.com.pk, Website: https://mjsp.com.pk/index.php/mjsp

Medical Journal of South Punjab
Volume 5, Issue 4, 2024; pp: 42-47
Original Article

Comparative study between outcomes of pregnant women with GDM with obesity and pregnant women with GDM without obesity

Syeda Zainab Gillani[1], Nida[2], Lubna Noor[3], Maryam Arif[4], Sadia Majeed[5], Najia Kasi[6]
[1-6]Combined Military Hospital, Multan, Pakistan.
[*]**Corresponding Author Email**: zaynab.gillani@gmail.com

ABSTRACT

Objective: This study aimed to evaluate and compare pregnancy outcomes in women with GDM who were obese (BMI ≥30 kg/m²) versus those with normal BMI (18.5–24.9 kg/m²).

Methods: A comparative cohort analysis was conducted involving 100 pregnant women diagnosed with GDM using IADPSG criteria, 50 with obesity and 50 with normal BMI. Outcomes assessed included mode of delivery, gestational weight gain, prevalence of hypertensive disorders, neonatal birth weight, and frequency of fetal hypertrophy.

Results: No statistically significant difference was observed in mode of delivery between the two groups (χ^2=2.15; df=1; p>0.05). However, obese women demonstrated significantly greater gestational weight gain (mean 15.30 kg vs. 10.58 kg; t=-27.05; df=98; p<0.001). Hypertensive disorders were markedly more prevalent in the obese cohort (26.0% vs. 2.0%; χ^2=11.96; df=1; p<0.001). Neonatal birth weight was significantly higher among infants born to obese mothers (mean 3611.4 g vs. 3238.8 g; t=-12.48; df=98; p<0.001), and hypertrophic newborns were substantially more frequent in the obese group (22.0% vs. 4.0%; χ^2=7.16; df=1; p<0.01).

Conclusion: Maternal obesity in the context of GDM is independently associated with excessive gestational weight gain, gestational hypertension, elevated neonatal birth weight, and a significantly higher prevalence of fetal hypertrophy. These findings underscore the imperative for targeted preconception weight optimization and rigorous antenatal surveillance in this high-risk population.

Keywords: GDM, gestational hypertension, pregnancy-induced obesity, pregnancy outcome, birth weight, fetal hypertrophy, obesity.

1. INTRODUCTION

The global escalation of obesity prevalence has generated a parallel surge in obesity-related complications during pregnancy, placing both maternal and fetal health at considerable risk.[1•2] In the United States, surveillance data from 2009–2010 indicated that approximately 35% of adults of both sexes were classified as obese, illustrating the scale of this public health challenge.[3] For women of reproductive age, elevated pre-pregnancy BMI not only impairs conception but also substantially increases the likelihood of spontaneous miscarriage, preterm labor, and complications spanning all stages of the perinatal continuum.[1•4] Furthermore, offspring of obese mothers are at elevated risk of developing overweight and obesity both in childhood and adulthood, perpetuating an intergenerational metabolic cycle.[5]

Excessive body weight is a recognized risk factor for both gestational diabetes mellitus (GDM) and pregnancy-induced hypertensive disorders. This relationship is largely driven by biological pathways such as reduced insulin sensitivity, persistent low-level inflammation, and abnormal blood lipid profiles.[1•4] GDM — defined as glucose intolerance first recognized during pregnancy — has seen a rising incidence globally and carries immediate risks for both mother and child, alongside long-term implications including increased susceptibility to type 2 diabetes and cardiovascular disease in both.[6•7] When obesity and GDM coexist, these metabolic derangements are compounded, producing a clinical phenotype associated with amplified obstetric morbidity. The resultant increased demand on healthcare resources, including more frequent antenatal appointments and advanced fetal monitoring, imposes a considerable socioeconomic burden on health systems.[1•4•8]

Despite a growing body of literature on obesity and GDM as independent risk factors, evidence examining their combined impact on pregnancy outcomes in South Asian populations remains limited. This study was therefore designed to compare maternal and neonatal outcomes in GDM-affected pregnancies stratified by maternal BMI status, with the aim of informing targeted clinical management strategies for this high-risk cohort.

2. METHODOLOGY

This comparative cohort study evaluated pregnancy outcomes across two groups: 50 pregnancies in women with obesity (defined as BMI ≥30 kg/m² per WHO criteria)[9] and 50 pregnancies in women with normal BMI (18.5–24.9 kg/m²). Gestational diabetes mellitus was confirmed in all subjects from both groups, with diagnoses relying on the standardized cutoffs defined by the International Association of Diabetes and Pregnancy Study Groups (IADPSG). [6,10] The total study cohort comprised 100 participants.

Primary outcome measures included: gestational age at delivery (in completed weeks), mode of delivery (vaginal, assisted vaginal, or cesarean section), total gestational weight gain (kg), and the presence of hypertensive disorders of pregnancy — encompassing gestational hypertension and chronic hypertension. Secondary neonatal outcomes included birth weight (grams) and the proportion of hypertrophic newborns, defined as infants demonstrating birth weight excessive relative to gestational age norms.

Data analysis was conducted using IBM SPSS Statistics for Windows (Version 25). To compare continuous data, independent samples t-tests were utilized, whereas categorical data was evaluated via Pearson's chi-square test. Statistical significance was defined as a p-value < 0.05.

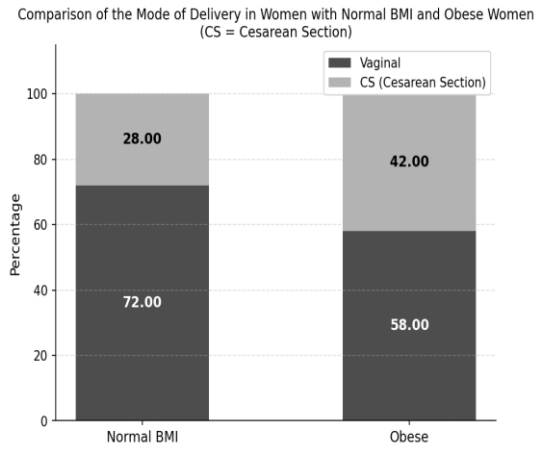
3. RESULTS

The study enrolled 100 participants — 50 women with normal BMI and 50 obese women — all diagnosed with GDM using IADPSG criteria.

Mode of Delivery: In the normal BMI group, 72.0% of women delivered vaginally and 28.0% via cesarean section (CS). In the obese group, 58.0% delivered vaginally and 42.0% via CS. Chi-square analysis revealed no statistically significant difference in delivery mode between the two groups (χ^2=2.15; df=1; p>0.05) (Fig. 1).

Gestational Weight Gain: Obese women gained a mean of 15.30 kg (SD ±1.04) during pregnancy, compared to 10.58 kg (SD ±0.67) in normal BMI women — a highly significant difference (t=-27.05; df=98; p<0.001). This substantially exceeds the IOM-recommended gestational weight gain of 5–9 kg for obese women (Fig. 2).

Fig-1: Comparing Delivery Outcomes Between Normal-BMI and Obese Pregnant Women



Hypertensive Disorders: Among obese women, 26.0% (n=13) were diagnosed with gestational or chronic hypertension, compared to only 2.0% (n=1) in the normal BMI group. This disparity was highly statistically significant (χ^2=11.96; df=1; p<0.001) (Fig. 3).

Fig-2: Analysis of Gestational Weight Gain Across Normal and Obese BMI Categories

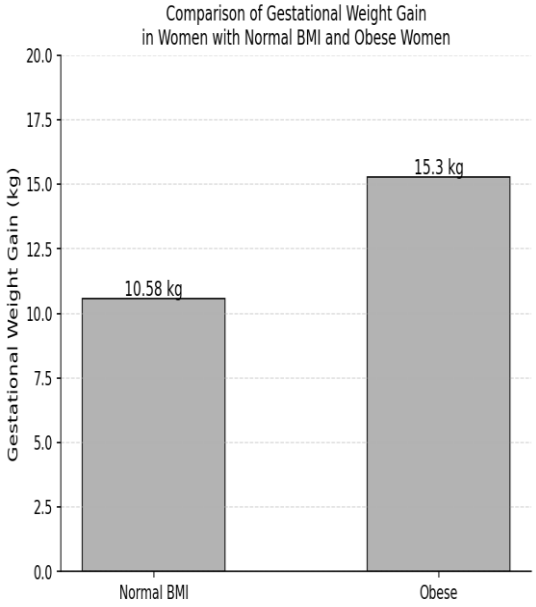
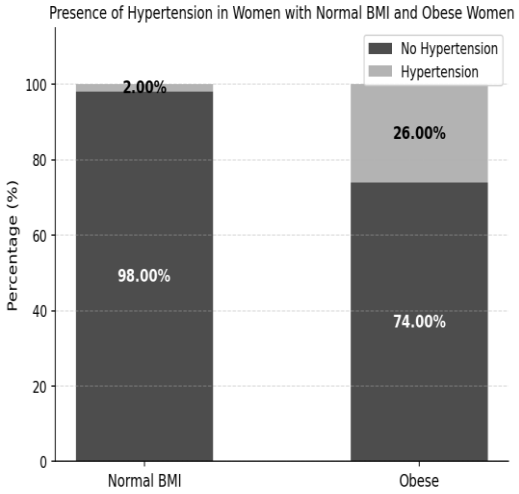
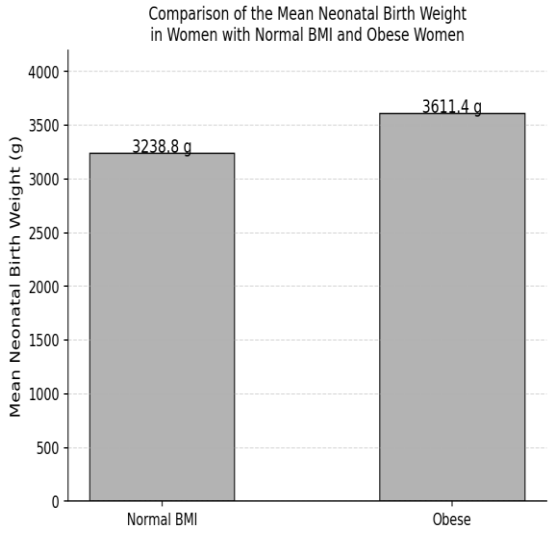


Fig-3: Comparing the Incidence of Hypertension Between Normal-BMI and Obese Groups



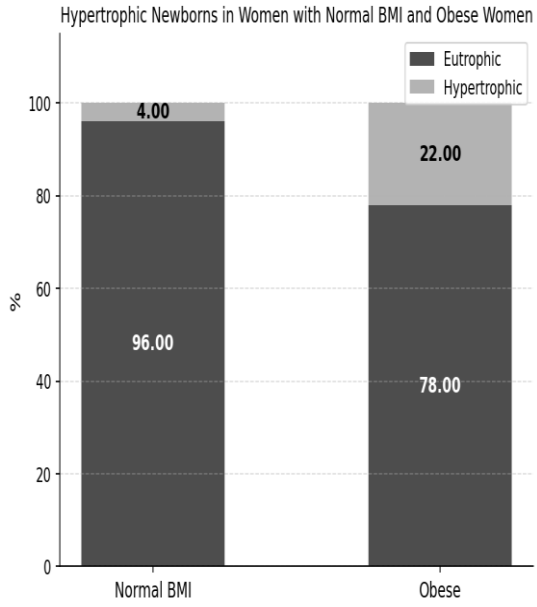
Neonatal Birth Weight: Infants born to obese mothers had significantly higher mean birth weights compared to the normal BMI group (3611.4 g vs. 3238.8 g; t=-12.48; df=98; p<0.001), a difference of approximately 372.6 grams (Fig. 4).

Fig-4: Analysis of Mean Neonatal Birth Weight Across Normal and Obese Maternal BMI Categories



Neonatal Birth Weight: Infants born to obese mothers had significantly higher mean birth weights compared to the normal BMI group (3611.4 g vs. 3238.8 g; t=-12.48; df=98; p<0.001), a difference of approximately 372.6 grams (Fig. 4).

Fig 5. Frequency of Hypertrophic Infants Across Normal and Obese Maternal BMI Categories



Fetal Hypertrophy: Hypertrophic infants accounted for 22.0% of births in the obese group (n=11), compared to just 4.0% in the normal BMI group (n=2) — a greater than fivefold difference that was statistically significant (χ^2=7.16; df=1; p<0.01) (Fig. 5).

4. DISCUSSION

The findings of this study affirm that maternal obesity, in the context of concurrent GDM, confers a substantially elevated risk of adverse obstetric and neonatal outcomes. These results are congruent with an extensive body of international literature demonstrating that increasing maternal BMI amplifies morbidity across multiple domains, including hypertensive disorders, pathological fetal growth, and excessive gestational weight gain.[11–13] The concurrent rise in GDM prevalence alongside increasing obesity rates represents an escalating public health challenge, with both conditions exerting overlapping and synergistic effects on pregnancy through shared metabolic pathways including insulin resistance, chronic hyperglycemia, and compensatory hyperinsulinemia.[11–13]

From a demographic standpoint, recent epidemiological data indicate that a growing proportion of women are entering pregnancy either overweight or obese.[2] In the United States, approximately half of all pregnant women have a pre-pregnancy BMI of 25 or above.[11] Gestational weight gain is a potentially modifiable risk factor strongly associated with macrosomia, preterm delivery, and adverse neonatal metabolic outcomes.[11–13] The 2009 Institute of Medicine guidelines recommend a total gestational weight gain of 5–9 kg for obese individuals.[16] In our cohort, the mean gestational weight gain in the obese group was 15.30 kg — substantially in excess of these recommendations — a pattern consistent with findings from comparable studies.[13,17]

Our finding of elevated neonatal birth weights and a markedly higher proportion of hypertrophic newborns (22.0% in the obese group versus 4.0% among normal

BMI women) is consistent with the established role of maternal obesity in promoting fetal overgrowth via excessive gestational weight gain and metabolic dysregulation.[11–13,18] While secondary neonatal outcomes such as meconium-stained amniotic fluid and neonatal hypoglycemia were not assessed, prior research has noted increased rates of these complications in pregnancies complicated by obesity and supraoptimal gestational weight gain.[12,18]

Notably, mode of delivery did not differ significantly between groups (χ^2=2.15; p>0.05), contrasting with findings from several large studies linking elevated BMI to higher cesarean section rates.[18–20] This discrepancy may partly be explained by our control group comprising normal BMI women with GDM, who themselves carry an elevated baseline risk for operative delivery due to hyperglycemia-related fetal overgrowth. As demonstrated by Zilberlicht et al., BMI, gestational weight gain, and hyperglycemia interact synergistically to compound adverse perinatal outcomes.[21] The substantially higher prevalence of hypertensive disorders in the obese group (26.0% versus 2.0%) aligns closely with evidence from Scifres et al., who demonstrated that obese women with GDM exceeding IOM weight gain targets face compounded risks of gestational hypertension.[22]

5. CONCLUSION

Maternal obesity in the context of GDM is independently associated with excessive gestational weight gain, gestational hypertension, elevated neonatal birth weight, and a significantly higher prevalence of fetal hypertrophy. These findings underscore the imperative for targeted preconception weight optimization and rigorous antenatal surveillance in this high-risk population.

6. REFERENCES

1. Ivanišević M, Kosi N, Đelmiš J, Juras J. Pregnancy, delivery and puerperium in obese women. Gynaecologia et perinatologia. 2015;24(3):89-98.
2. Vranes HS, Djakovic I. Length and weight of newborns in Croatia from 1985 to 2009. Wiener Klinische Wochenschrift. 2015 Sep 1;127.
3. Cunningham FG, Leveno KJ, Bloom SL, et al. Obesity. In: Williams Obstetrics. New York: McGraw Hill Education; 2014:961-72.
4. Đelmiš J, Pavić M, Ivanišević M, et al. Body mass index and pregnancy outcome. In: XXXVIII Alpe Adria Meeting of Perinatal Medicine; 2016. pp. 31-32.
5. Finer S. Fetal programming via maternal diabetes: the controversy continues. Diabetic Medicine. 2015 Mar 1;32(3).
6. Đelmiš J, Ivanišević M, Juras J, Herman M. Diagnosis of hyperglycemia in pregnancy. Gynaecologia et perinatologia. 2010 Jun 1;19(2):86-9.
7. Djaković I, Sabolović Rudman S, Gall V, et al. Do changing diagnostic criteria for gestational diabetes influence pregnancy outcome? Acta Clinica Croatica. 2016 Nov 9;55(3):422-7.
8. Aktulay A, Engin-Ustun Y, Sahin Ozkan M, et al. Gestational diabetes mellitus seems to be associated with inflammation. Acta Clinica Croatica. 2015 Dec 1;54(4):475-8.
9. World Health Organization. Obesity: preventing and managing the global epidemic. WHO Technical Report Series No. 894. Geneva: WHO; 2000.
10. Metzger BE, Gabbe SG, Persson B, et al. IADPSG recommendations on the diagnosis and classification of

hyperglycemia in pregnancy. Diabetes Care. 2010 Jul 1;33(7):e98.

11. Maier JT, Schalinski E, Gauger U, Hellmeyer L. Antenatal BMI and weight gain in pregnancy — association with pregnancy and birthing complications. Journal of Perinatal Medicine. 2016 May 1;44(4):397-404.

12. Maayan-Metzger A, Schushan-Eisen I, Strauss T, et al. Gestational weight gain and BMI impact outcomes of diabetic mothers and infants. Acta Paediatrica. 2015 Nov;104(11):1150-5.

13. Gante I, Amaral N, Dores J, Almeida MC. Impact of gestational weight gain on obstetric and neonatal outcomes in obese diabetic women. BMC Pregnancy and Childbirth. 2015 Dec;15:1-6.

14. Zilko CE, Rehkopf D, Abrams B. Association of maternal gestational weight gain with short- and long-term maternal and child health outcomes. American Journal of Obstetrics and Gynecology. 2010 Jun 1;202(6):574-e1.

15. American College of Obstetricians and Gynecologists. ACOG Committee Opinion No. 548: weight gain during pregnancy. Obstetrics and Gynecology. 2013 Jan;121(1):210-2.

16. Institute of Medicine. Weight Gain During Pregnancy: Reexamining the Guidelines. Washington DC: National Academies Press; 2009.

17. Narayanan RP, Weeks AD, Quenby S, et al. Fit for Birth — weight changes in obese pregnant women and maternal/neonatal outcomes. Clinical Obesity. 2016 Feb;6(1):79-88.

18. Dennedy MC, Avalos G, O'Reilly MW, et al. The impact of maternal obesity on gestational outcomes. Irish Medical Journal. 2012 May 1;105(5 Suppl):23-5.

19. Al-Kubaisy W, Al-Rubaey M, Al-Naggar RA, et al. Maternal obesity and its relation with cesarean section: a hospital-based cross-sectional study in Iraq. BMC Pregnancy and Childbirth. 2014 Dec;14:1-5.

20. Marchi J, Berg M, Dencker A, et al. Risks associated with obesity in pregnancy: a systematic review of reviews. Obesity Reviews. 2015 Aug;16(8):621-38.

21. Zilberlicht A, Feferkorn I, Younes G, et al. The mutual effect of pregestational BMI, maternal hyperglycemia and gestational weight gain on adverse pregnancy outcomes. Gynecological Endocrinology. 2016 May 3;32(5):416-20.

22. Scifres C, Feghali M, Althouse AD, et al. Adverse outcomes and potential targets for intervention in gestational diabetes and obesity. Obstetrics & Gynecology. 2015 Aug 1;126(2):316-25.