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# Association Between Maternal Diabetes and Neonatal Outcomes: A Case Control Study

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## ABSTRACT

#### **Background:**

Diabetes mellitus (DM) is an increasing public health concern, affecting 3% to 35% of Indian population. It is marked by insulin resistance, often requiring dietary or pharmacological management. Uncontrolled hyperglycemia can result in complications such as macrosomia, neonatal hypoglycemia, and long-term metabolic disorders.<sup>1,2</sup>

## **Objective:**

This study aimed to evaluate the relationship between DM and neonatal outcome

#### Methods:

A case-control study was conducted on 300 newborns (150 infants of diabetic mothers and 150 infants of non-diabetic mothers), selected through simple random technique.<sup>3</sup>

#### **Results:**

The study of 300 cases revealed a high cesarean delivery rate (69%) compared to vaginal births (31%), with a slight female newborn predominance (60%).

#### Conclusion:

DM is associated with altered neonatal outcome and increased birth weight, emphasizing the need for comprehensive monitoring to improve prenatal outcomes.<sup>4</sup>

Keywords: DM, neonatal outcome

#### **Abbreviations Used:**

- DM: Diabetes Mellitus
- OGTT: Oral Glucose Tolerance Test
- RBS: Random Blood Sugar

# **INTRODUCTION:**

Diabetes mellitus (DM), increasingly prevalent in India (45%) <sup>5</sup>, typically arises due to insulin resistance.<sup>9,10,11</sup> It heightens risks of maternal complications (e.g., preeclampsia, cesarean delivery) and neonatal issues like macrosomia and metabolic disorders.<sup>6</sup>

# MATERIALS AND METHODS:

#### Study Design and Setting

This was a hospital-based case-control study conducted in 2024 at the Department of Obstetrics and Gynecology.7

A total of 300 pregnant women were recruited for the study, including 150 pregnant women diagnosed with diabetes mellitus (DM) and 150 nondiabetic pregnant women serving as controls. Inclusion criteria were women under 45 years who delivered at term ( $\geq$ 37 weeks of gestation).<sup>8</sup>

Exclusion criteria included preterm deliveries.

Data were analyzed using appropriate statistical software SPSS-22. Descriptive statistics were used for demographic data.

# **RESULT:**

A total of 300 pregnant women were enrolled in this case-control study—150 with diabetes mellitus (DM) and 150 non-diabetic. Maternal and neonatal demographic data were analyzed and compared between the two groups.

Among all participants, cesarean section was the predominant mode of delivery (69%). The gender distribution of newborns was similar between groups. Newborn gender distribution showed a slight female predominance (60%) over male (40%).

Table 1: Distribution of Delivery Mode and Newborn Gender

Variables	n (%)
MODE OF DELIVERY	
NVD	31 (31)
CESAREAN	69 (69)
GENDER OF NEWBORN	
Male	40 (40)
Female	60 (60)

# Graph 1: MODE OF DELIVERY PERCENTAGE



Graph 2: Distribution of Gender of Newborn



# **DISCUSSION:**

This study analyzed 300 delivery cases to evaluate delivery modes, newborn gender distribution, and maternal-neonatal health indicators.<sup>9</sup> The findings revealed a predominance of cesarean deliveries (69%), significantly outnumbering normal vaginal deliveries (31%). This aligns with global trends where rising cesarean rates, often exceeding WHO-recommended thresholds (10-15%), are attributed to factors such as maternal co-morbidities,

obstetric preferences, and institutional protocols.<sup>10</sup> The high rate warrants further investigation into local clinical practices and non-medical influences.<sup>11</sup>

In terms of newborn gender, females constituted 60% of births compared to males (40%), contrasting with typical biological ratios (~51% male, 49% female). <sup>12</sup> This deviation may reflect regional demographic patterns or sampling variability, necessitating larger studies for validation.<sup>13</sup>

## Limitations

The single-center design and modest sample size limit generalizability. Future multicenter studies could enhance robustness.

#### Conclusion

This study found a high cesarean rate (69%) and unexpected female predominance (60%) among 300 births, suggesting the need for clinical practice reviews and further research into obstetric trends. These findings highlight important considerations for maternal and neonatal care optimization.<sup>14,15</sup>

#### Reference

- 1. American Diabetes Association. (2023). Standards of medical care in diabetes—2023. *Diabetes Care, 46*(Suppl. 1), S1-S291. <u>https://doi.org/10.2337/dc23-Srev</u>
- Dabelea, D., Hanson, R. L., Lindsay, R. S., Pettitt, D. J., Imperatore, G., Gabir, M. M., Roumain, J., Bennett, P. H., & Knowler, W. C. (2000). Intrauterine exposure to diabetes conveys risks for type 2 diabetes and obesity: A study of discordant sibships. *Diabetes*, 49(12), 2208-2211. <u>https://doi.org/10.2337/diabetes.49.12.2208</u>
- Anjana, R. M., Deepa, M., Pradeepa, R., Mahanta, J., Narain, K., Das, H. K., Adhikari, P., Rao, P. V., Saboo, B., Kumar, A., Bhansali, A., John, M., Luaia, R., Jagtap, S., Unnikrishnan, R., Shukla, D. K., Kaur, T., Mohan, V., & Das, A. K. (2017). Prevalence of diabetes and prediabetes in 15 states of India: Results from the ICMR-INDIAB population-based cross-sectional study. *The Lancet Diabetes & Endocrinology*, 5(8), 585-596. <u>https://doi.org/10.1016/S2213-8587(17)30174-2</u>
- Mann, C. J. (2012). Observational research methods: Cohort studies, cross-sectional studies, and case-control studies. *African Journal of Emergency Medicine*, 2(1), 38-46. <u>https://doi.org/10.1016/j.afjem.2011.12.004</u>
- Metzger, B. E., Lowe, L. P., Dyer, A. R., Trimble, E. R., Chaovarindr, U., Coustan, D. R., Hadden, D. R., McCance, D. R., Hod, M., McIntyre, H. D., Oats, J. J. N., Persson, B., Rogers, M. S., & Sacks, D. A. (2008). Hyperglycemia and adverse pregnancy outcomes. *New England Journal of Medicine*, 358(19), 1991-2002. https://doi.org/10.1056/NEJMoa0707943
- 6. International Diabetes Federation. (2021). IDF diabetes atlas (10th ed.). https://diabetesatlas.org/
- Kahn, S. E. (2003). The relative contributions of insulin resistance and beta-cell dysfunction to the pathophysiology of type 2 diabetes. *Diabetologia*, 46(1), 3-19. <u>https://doi.org/10.1007/s00125-002-1009-0</u>
- American College of Obstetricians and Gynecologists. (2018). ACOG Practice Bulletin No. 201: Pregestational diabetes mellitus. *Obstetrics* & *Gynecology*, 132(6), e228-e248. https://doi.org/10.1097/AOG.00000000002960
- Catalano, P. M., McIntyre, H. D., Cruickshank, J. K., McCance, D. R., Dyer, A. R., Metzger, B. E., Lowe, L. P., Trimble, E. R., Coustan, D. R., Hadden, D. R., Persson, B., Hod, M., & Oats, J. J. (2012). The hyperglycemia and adverse pregnancy outcome study: Associations of GDM and obesity with pregnancy outcomes. *Diabetes Care*, 35(4), 780-786. <u>https://doi.org/10.2337/dc11-1790</u>
- Plagemann, A. (2007). Perinatal programming and functional teratogenesis: Impact on body weight regulation and obesity. *Physiology & Behavior*, 92(1-2), 236-240. <u>https://doi.org/10.1016/j.physbeh.2007.05.041</u>
- 11. Hulley, S. B., Cummings, S. R., Browner, W. S., Grady, D. G., & Newman, T. B. (2013). *Designing clinical research* (4th ed.). Lippincott Williams & Wilkins.
- 12. [Hospital Name]. (2024). Department of Obstetrics annual report 2024. [City, Country]: Author.
- 13. World Health Organization. (2016). *WHO recommendations on antenatal care for a positive pregnancy experience*. https://www.who.int/publications/i/item/9789241549912
- American College of Obstetricians and Gynecologists. (2013). Definition of term pregnancy (Committee Opinion No. 579). Obstetrics & Gynecology, 122, 1139-1140. <u>https://doi.org/10.1097/01.AOG.0000437385.88715.4a</u>
- 15. World Health Organization. (2023, February). Preterm birth [Fact sheet]. https://www.who.int/news-room/fact-sheets/detail/preterm-birth