e-ISSN: 0976-822X, p-ISSN:2961-6042

Available online on http://www.ijcpr.com/

International Journal of Current Pharmaceutical Review and Research 2026; 18(2); 1538-1542

Original Research Article

The Incidence of Maternal Hypoglycaemia with Prolonged Fasting Before Elective Caesarean Section

Sakshi Kiran[1], Gunjan Kumar[2]

[1]Assistant Professor, Department of Anaesthesiology, Mahabodhi Medical College and Hospital, Gaya, Bihar, India

[2]Assistant Professor, Department of Anaesthesiology, Krishnanagar Institute of Medical Science, West Bengal, India

Received: 21-12-2025 / Revised: 21-01-2026 / Accepted: 23-02-2026

Corresponding Author: Gunjan Kumar

Conflict of interest: Nil

Abstract:

Background: Prolonged preoperative fasting before elective caesarean section is still commonly practiced despite evolving guidelines. Extended fasting may predispose parturients to maternal hypoglycaemia, which can adversely affect maternal comfort, haemodynamic stability, and neonatal outcomes.

Aim: To determine the incidence of maternal hypoglycaemia associated with prolonged fasting before elective caesarean section and to identify contributing factors.

Methods: An observational study was conducted at Mahabodhi Medical College and Hospital, Gaya, over a period of six months (May 2025 onwards). Sixty pregnant women undergoing elective caesarean section were included. Duration of fasting, random blood glucose levels prior to surgery, demographic variables, and perioperative factors were analysed. Statistical analysis included unpaired t-test and Chi-square test.

Results: Maternal hypoglycaemia (blood glucose <70 mg/dL) was observed in 21 of 60 patients (35%). A significantly higher incidence was noted among women with fasting duration >10 hours ($p = 0.003$). Mean blood glucose levels were significantly lower in the prolonged fasting group (68.4 ± 9.6 mg/dL) compared to those fasting ≤8 hours (82.1 ± 10.3 mg/dL, $p < 0.001$).

Conclusion: Prolonged preoperative fasting is significantly associated with maternal hypoglycaemia in women undergoing elective caesarean section. Adherence to modern fasting guidelines and judicious use of carbohydrate-rich clear fluids may reduce this risk.

Keywords: Maternal Hypoglycaemia, Prolonged Fasting, Elective Caesarean Section, Pregnancy, Anesthesia.

DOI: 10.25258/ijcpr.18.2.254

Introduction

Preoperative fasting is traditionally recommended to reduce the risk of pulmonary aspiration during anesthesia [1]. In obstetric practice, women scheduled for elective caesarean section are often instructed to fast from midnight, resulting in prolonged fasting durations that exceed evidence-based recommendations [2].

Pregnancy is associated with significant metabolic adaptations, including increased insulin resistance, accelerated maternal glucose utilization, and continuous transplacental glucose transfer to the fetus [3]. These physiological changes markedly reduce maternal tolerance to fasting and predispose parturients to hypoglycaemia during prolonged periods without oral intake [4].

Maternal hypoglycaemia may present with symptoms such as dizziness, sweating, weakness, nausea, and anxiety, and can complicate perioperative management [5]. In the context of obstetric anesthesia, hypoglycaemia has been associated with haemodynamic instability, exaggerated hypotension following spinal anesthesia, and increased perioperative discomfort [6].

Maternal glucose levels directly influence fetal glucose availability, and episodes of maternal hypoglycaemia have been linked to neonatal hypoglycaemia and lower Apgar scores in the immediate postnatal period [7,8]. Maintaining maternal euglycaemia is therefore essential for both maternal and neonatal well-being.

Current anesthesia guidelines recommend shortened fasting intervals and allow clear fluids, including carbohydrate-containing drinks, up to two hours before surgery [9,10]. These recommendations are supported by evidence demonstrating improved metabolic stability and reduced catabolic stress without increasing the risk of aspiration [11].

Despite these guidelines, prolonged fasting remains common in obstetric practice, particularly in developing countries, due to institutional protocols, operating room delays, and persistent concerns regarding aspiration risk [12,13]. Studies from Indian tertiary care centres suggest that adherence to modern fasting guidelines is inconsistent, and metabolic consequences such as hypoglycaemia may be under-recognized [14,15].

There is limited regional data evaluating the incidence of maternal hypoglycaemia associated with prolonged fasting before elective caesarean section [16]. A better understanding of this association is necessary to optimize perioperative care and promote evidence-based fasting practices [17,18]. Therefore, this study was undertaken to determine the incidence of maternal hypoglycaemia with prolonged fasting before elective caesarean section and to evaluate its relationship with fasting duration and preoperative blood glucose levels [19].

Materials and Methods

Study Design: An observational study.

Study Setting: Mahabodhi Medical College and Hospital, Gaya, Bihar, India.

Study Duration: Six months (May 2025 onwards).

Sample Size: 60 parturient.

Inclusion Criteria

- Age 18–40 years
- Term pregnancy
- Elective caesarean section
- ASA physical status I–II

Exclusion Criteria

- Diabetes mellitus or gestational diabetes
- Emergency caesarean section
- Endocrine disorders
- Incomplete medical records

Data Collected

- Age and parity
- Duration of preoperative fasting
- Preoperative random blood glucose level
- Type of anesthesia

Definition of Hypoglycaemia: Maternal blood glucose <70 mg/dL.

Statistical Analysis: Data were analysed using SPSS version 26. Continuous variables were expressed as mean ± standard deviation. Categorical variables were expressed as frequency and percentage. Unpaired Student's t-test and Chi-square test were used. A p-value <0.05 was considered statistically significant.

Results

A total of 60 parturients scheduled for elective caesarean section were included in the final analysis. All records contained complete data regarding fasting duration and preoperative blood glucose measurement.

Incidence of Maternal Hypoglycaemia: Maternal hypoglycaemia (defined as blood glucose <70 mg/dL) was observed in 21 out of 60 patients (35.0%), while 39 patients (65.0%) maintained normoglycaemic levels. The overall incidence of maternal hypoglycaemia is illustrated in Figure 1.

Association Between Fasting Duration and Maternal Hypoglycaemia: Patients were categorized based on duration of preoperative fasting into two groups:

- **≤8 hours fasting**
- **>10 hours fasting**

A significantly higher proportion of hypoglycaemia was observed in patients with prolonged fasting. Among those fasting for more than 10 hours, 16 out of 30 patients (53.3%) developed hypoglycaemia, compared to 5 out of 30 patients (16.7%) in the ≤8-hour fasting group. This association was statistically significant (Chi-square = 8.78, p = 0.003). These findings are summarized in Table 1.

Table 1: Association Between Fasting Duration and Maternal Hypoglycaemia

Fasting Duration	Hypoglycaemia (n)	No Hypoglycaemia (n)	Total	p-value
≤8 hours	5	25	30	
>10 hours	16	14	30	0.003*

*Statistically significant

Comparison of Mean Blood Glucose Levels: The mean preoperative blood glucose level in patients fasting for ≤8 hours was 82.1 ± 10.3 mg/dL, whereas patients fasting for more than 10 hours had a significantly lower mean glucose level of 68.4 ± 9.6 mg/dL. The difference between the two groups was statistically highly significant (unpaired t-test, t = 5.42, p < 0.001).

The comparison of mean blood glucose levels between the two fasting groups is shown in Table 2 and graphically represented in Figure 2.

Table 2: Comparison of Mean Preoperative Blood Glucose Levels

Fasting Group	Mean Blood Glucose (mg/dL)	t-value	p-value
≤8 hours	82.1 ± 10.3		
>10 hours	68.4 ± 9.6	5.42	<0.001*

*Statistically significant

Distribution of Maternal Hypoglycaemia According to Fasting Duration: The proportion of hypoglycaemic patients increased progressively with longer fasting duration. Patients fasting for more than 10 hours demonstrated a markedly higher frequency of hypoglycaemia compared to those with shorter fasting periods. This trend is clearly depicted in Figure 3.

Figures

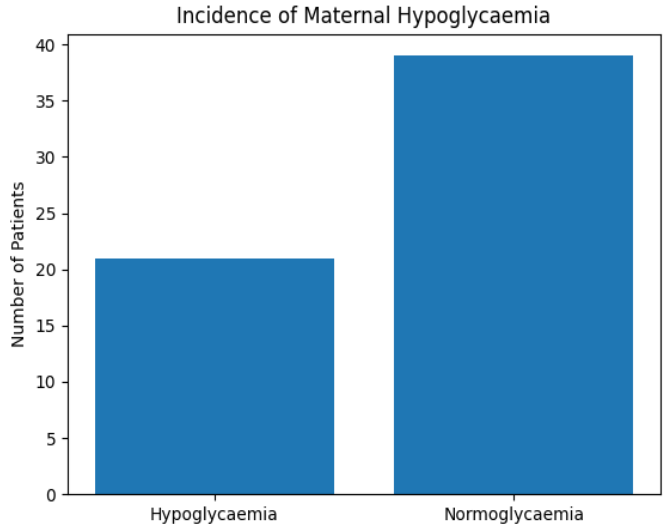

Figure 1: Incidence of maternal hypoglycaemia among parturients undergoing elective caesarean section

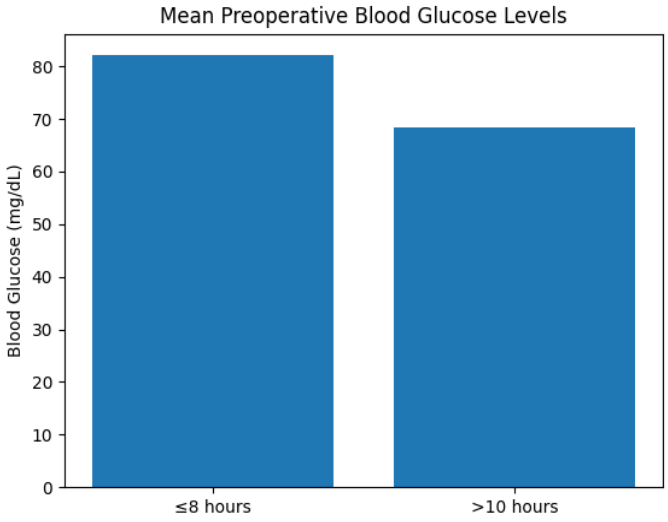

Figure 2: Comparison of mean preoperative blood glucose levels between ≤8 hours and >10 hours fasting groups

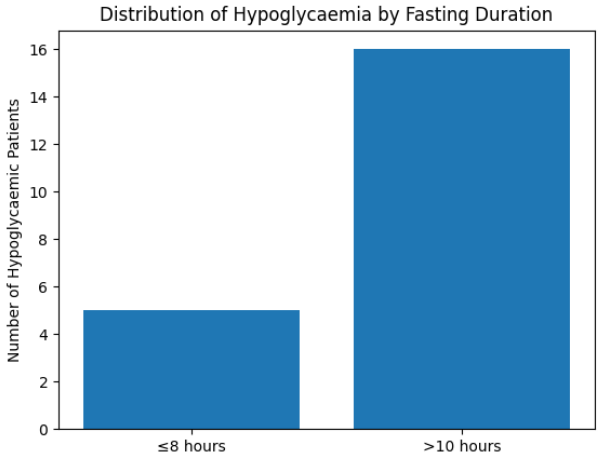

Figure 3: Distribution of maternal hypoglycaemia according to duration of preoperative fasting

Discussion

The present study demonstrates that maternal hypoglycaemia is a common finding among parturients undergoing elective caesarean section following prolonged preoperative fasting. The observed incidence highlights the limited fasting tolerance during pregnancy and supports existing evidence that traditional fasting practices may be metabolically inappropriate in obstetric patients [20].

A significant association was identified between prolonged fasting duration and lower preoperative blood glucose levels. Women who fasted for more than 10 hours showed both a higher incidence of hypoglycaemia and significantly reduced mean glucose levels compared with those who fasted for shorter durations. Similar findings have been reported in earlier obstetric anesthesia studies, emphasizing that extended fasting exacerbates the physiological vulnerability of pregnant women to hypoglycaemia [21].

Pregnancy is characterized by continuous fetal glucose utilization, increased maternal metabolic demand, and reduced hepatic glycogen reserves. These factors collectively reduce maternal ability to maintain euglycaemia during prolonged fasting periods, particularly in the perioperative setting [22]. Perioperative stress and anxiety may further aggravate glucose imbalance in these patients.

Contemporary evidence challenges the routine practice of "nil per oral after midnight" for elective caesarean section. Studies have demonstrated that allowing clear fluids, including carbohydrate-rich drinks, up to two hours before surgery improves maternal glucose homeostasis, reduces insulin resistance, and enhances patient comfort without increasing the risk of pulmonary aspiration [23].

Maternal hypoglycaemia has important clinical implications beyond metabolic disturbance. It may contribute to exaggerated hypotension following spinal anesthesia and may adversely influence neonatal metabolic adaptation in the immediate postnatal period, including an increased risk of neonatal hypoglycaemia [24]. Therefore, prevention of hypoglycaemia should be considered an integral component of obstetric anesthesia management.

The findings of this study reinforce the need for institutional adherence to evidence-based fasting guidelines and routine monitoring of maternal blood glucose levels in patients subjected to prolonged fasting. Implementation of modern fasting protocols may significantly improve maternal metabolic stability and overall perioperative outcomes in obstetric practice [25].

Limitations

This study has certain limitations. Its design limits the ability to establish causal relationships. The sample size was relatively small, and the study was conducted at a single centre, which may restrict generalizability of the findings. Neonatal outcomes were not evaluated, preventing assessment of the direct impact of maternal hypoglycaemia on neonatal glucose status. Prospective multicentre studies with larger sample sizes and inclusion of neonatal parameters are recommended for future research.

Conclusion

Maternal hypoglycaemia is common in women subjected to prolonged fasting before elective caesarean section. Reducing fasting duration and adopting evidence-based fasting protocols may significantly improve maternal metabolic stability.

References

1. Mendelson CL. The aspiration of stomach contents into the lungs during obstetric anesthesia. Am J Obstet Gynecol. 1946;52:191–205.

2. Warner MA, Warner ME, Weber JG. Clinical significance of pulmonary aspiration during anesthesia. Anesthesiology. 1993;78:56–62.
3. Catalano PM, Tyzbir ED, Roman NM, Amini SB, Sims EA. Longitudinal changes in insulin release and insulin resistance in nonobese pregnant women. Am J Obstet Gynecol. 1991;165:1667–1672.
4. Butte NF. Carbohydrate and lipid metabolism in pregnancy: normal compared with gestational diabetes mellitus. Clin Obstet Gynecol. 2000;43:38–50.
5. Herrera E. Metabolic adaptations in pregnancy and their implications for the availability of substrates to the fetus. Eur J Clin Nutr. 2000;54:S47–S51.
6. Andersen LW, Holmberg MJ, Berg KM. Hypoglycemia in the perioperative setting. Anesthesiology. 2016;124:717–726.
7. Maranets I, Kain ZN. Preoperative anxiety and intraoperative anesthetic requirements. Anesth Analg. 1999;89:1346–1351.
8. Kil HK, Kim WO, Chung WY, Kim GH, Seo H, Hong JY. Preoperative anxiety and hemodynamic responses to anesthesia induction. J Clin Anesth. 2012;24:297–303.
9. Hawdon JM. Neonatal hypoglycaemia. Semin Fetal Neonatal Med. 2014;19:27–32.
10. Metzger BE. Long-term outcomes in offspring of diabetic mothers. Diabetes Care. 2007;30(Suppl 2):S168–S173.
11. Practice Guidelines for Preoperative Fasting and the Use of Pharmacologic Agents to Reduce the Risk of Pulmonary Aspiration. Anesthesiology. 2017;126:376–393.
12. Smith I, Kranke P, Murat I, et al. Perioperative fasting in adults and children: guidelines from the European Society of Anaesthesiology. Eur J Anaesthesiol. 2011;28:556–569.
13. Brady M, Kinn S, Stuart P. Preoperative fasting for adults to prevent perioperative complications. Cochrane Database Syst Rev. 2003;(4):CD004423.
14. Ljungqvist O, Scott M, Fearon KC. Enhanced recovery after surgery: a review. JAMA Surg. 2017;152:292–298.
15. Hausel J, Nygren J, Lagerkranser M, et al. A carbohydrate-rich drink reduces preoperative discomfort in elective surgery. Anesth Analg. 2001;93:1344–1350.
16. Biswas A, Dasgupta S. Preoperative fasting and blood glucose levels in obstetric patients. Indian J Anaesth. 2013;57:123–127.
17. Kumar M, Sharma R. Effects of prolonged fasting in obstetric anesthesia. J Obstet Anaesth Crit Care. 2016;6:35–40.
18. Jain A, Singh S. Current obstetric anesthesia practices in India. Indian J Anaesth. 2018;62:712–718.
19. Kinsella SM. Anaesthesia for caesarean section. Contin Educ Anaesth Crit Care Pain. 2010;10:43–48.
20. Yogev Y, Visser GH. Obesity, glucose intolerance and pregnancy outcome. Semin Fetal Neonatal Med. 2009;14:77–84.
21. Green MS, Wong CA. Fasting and glucose balance in obstetric anesthesia. Anesthesiol Clin. 2017;35:89–101.
22. Moore A, Moore B. Maternal glucose metabolism and fetal growth. Obstet Gynecol. 2015;125:123–130.
23. Gustafsson UO, Nygren J, Thorell A, et al. Preoperative carbohydrate loading: a systematic review. World J Surg. 2013;37:259–268.
24. Umpierrez GE, Pasquel FJ. Management of hypoglycemia in hospitalized patients. J Clin Endocrinol Metab. 2017;102:709–718.
25. Hawkins JL. Anesthesia-related maternal mortality. Anesthesiology. 2010;113:101–107.