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ANALYZING THE ROLE OF PERIOPERATIVE DEXAMETHASONE IN REDUCING THE RISK OF PONV IN PATIENTS UNDERGOING CAESAREAN SECTION UNDER SPINAL ANESTHESIA

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Abstract

Background: *PONV, or Postoperative nausea and vomiting is common and distressing side effect after caesarean section under spinal anesthesia, affecting maternal comfort, recovery, and satisfaction. Dexamethasone, a corticosteroid with proven antiemetic and analgesic properties, has been studied as a prophylactic agent in various surgeries. However, its role in reducing PONV specifically in obstetric patients undergoing caesarean section remains an area of clinical interest.*

Objective: *The primary goal of the trial was to ascertain how well single-dose dexamethasone reduced PONV.*

Methodology: *Ganga Ram Hospital Lahore provided data after the acceptance of the summary. Data for this research came from a questionnaire that asked participants about their experiences with analyzing the role of perioperative dexamethasone helps to reduce the chance of PONV in persons with caesarean section performed under spinal anesthesia. The goals of the research and the procedures for obtaining participants' agreement were outlined in the first steps.*

Results: *The study included 60 women under spinal anesthesia having a cesarean section, separated equally into dexamethasone and saline groups. The dexamethasone the group had a significantly decreased incidence of vomiting within 24 hours (13.3%) than the saline group (33.3%), and the mean vomiting episodes were fewer (0.3 vs 0.8). Requirement of rescue ondansetron was also reduced (16.7% vs 36.7%). Additionally, total analgesic dose and rescue analgesia requirement were lower in the dexamethasone group, indicating better pain control. Overall, dexamethasone improved both PONV outcomes and analgesic requirements.*

Conclusion: *Perioperative administration of dexamethasone (8 mg IV) considerably Reduced the incidence and frequency of postoperative vomiting, as well as the requirement for rescue antiemetics in women following caesarean section under spinal anesthesia. It also showed a trend toward reduced analgesic*

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requirements. Dexamethasone is therefore a safe, effective, and economical option for improving maternal comfort and recovery.

Introduction:

PONV, or postoperative nausea and vomiting, is one of the most prevalent side effects of anesthesia and surgery. Numerous factors, including the patient's age, gender, the medications given, hemodynamic changes, and the choice of anesthetic procedure, might cause it. PONV is more distressing to many patients than postoperative pain; some even claim that enduring pain is preferable to enduring nausea and vomiting. Caesarean births under regional anesthesia are associated with a somewhat high incidence of intraoperative and postoperative nausea and vomiting (50%–80%) if a preventative antiemetic is not given (Rasheed et al., 2019) (Selzer et al., 2020)

Patients who undergo a cesarean delivery are more likely than those who give birth vaginally to experience quick and severe postoperative pain, with reported rates of approximately 85% and 57%, respectively. Nociceptor activation, which is mostly brought on by the surgical tissue injury following cesarean delivery, is a major cause of severe postoperative pain. A significant worry is the shift from acute to chronic pain after cesarean , which affects 11.2% of cases in the first postoperative year(Ioannopoulos et al., 2025)

Because of the bad effects that come with taking too many opioids, a multimodal analgesia approach is recommended. This should include acetaminophen, no steroidal anti-inflammatory drugs (NSAIDs), neuraxial and systemic opioids, opioids only for rescue analgesia, and other pain-relieving drugs like gabapentin and ketamine(Abebe et al., 2024)

Intravenous (IV) dexamethasone may improve analgesic efficacy up to 24 hours postoperatively and prolong the time to first rescue analgesic request following cesarean delivery, according to a 2022 meta-analysis that included 13 RCTs published between 2000 and 2019. However, the limited information available made it impossible to draw firm conclusions about this treatment's efficacy and safety(Kalawa & Wongseeda, 2025)

Currently, cesarean sections account for 21% of all deliveries. A cesarean section is the delivery of a fetus via an abdominal and uterine incision (hysterotomy). Postpartum discomfort can be treated with injectable or over-the-counter drugs. The choice of analgesics is influenced by both the level of discomfort and the type of anesthesia (general, spinal, or epidural). In order to numb the lower body, a local anesthetic is given into the subarachnoid area during spinal anesthesia(Fenta et al., 2021)

High-dose intraoperative dexamethasone (>0.2 mg/kg) has been shown to reduce the need for opioids and post-operative discomfort. Incorporating moderate amounts of dexamethasone (0.1-0.2 mg/kg) into a multimodal analgesic strategy after surgery is thought to be safe, effective, and associated with few side effects. After a cesarean delivery, preoperative intravenous dexamethasone is significantly more beneficial in reducing postoperative discomfort. Additionally, a decreased incidence of rebound discomfort has been linked to intraoperative IV dexamethasone. A single intraoperative dosage of dexamethasone 0.1 mg/kg reduces the need for total analgesics by providing a notable analgesic benefit in the early postoperative phase(Hamed Hassan Saafan et al., 2025)

The study especially sought to determine whether there was a difference in the antiemetic impact and adverse effects when dexamethasone was supplied alone vs diluted in normal saline, despite the fact that the same amount of the medicine was utilized in both groups.

Material and Methods:

This cross-sectional study was conducted at Ganga Ram Hospital, Lahore, following approval of the research synopsis by the Departmental Research Committee of the University of Lahore. The study was carried out over a period of four months. A total of 60 participants were included, selected through purposive sampling. The final sample size was calculated using Rao software, with a margin of error of 5%, a confidence level of 95%, and a

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response distribution of 80%. Eligible participants were women aged 18 to 45 years scheduled for elective or emergency caesarean section under spinal anesthesia. Patients with cardiovascular comorbidities and those with multiple gestations (e.g., twins or more) were excluded from the study. Ethical approval was obtained from the University of Lahore's Ethics Committee, and the study adhered strictly to ethical principles. Written informed consent was obtained from all participants after they were provided with detailed information regarding the study objectives, procedures, and potential risks. Participants were assured of the confidentiality and anonymity of their data, and they were informed of their right to withdraw from the study at any time. The study ensured that no harm came to participants during any phase of the research.

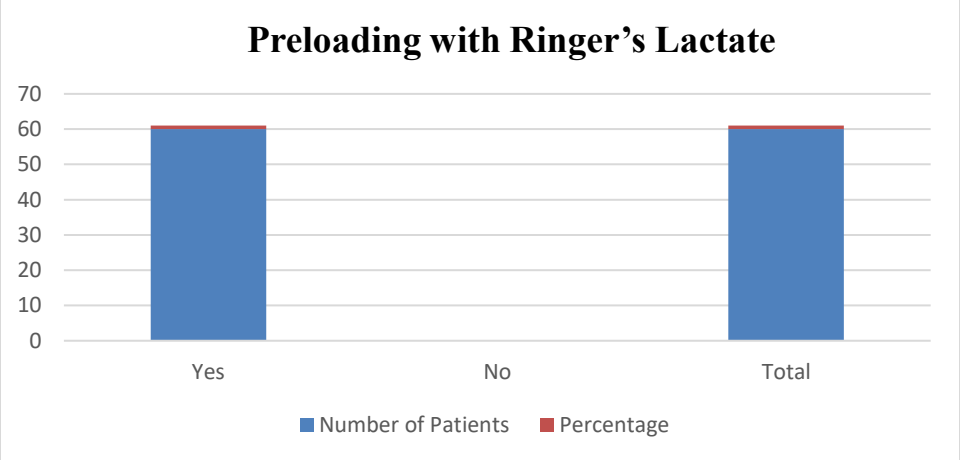
Data were collected using a structured questionnaire designed to assess the role of perioperative dexamethasone in reducing the risk of postoperative nausea and vomiting (PONV) in women undergoing caesarean section under spinal anesthesia. Demographic information, including age, educational level, and other relevant details, was also recorded. Using purposive sampling, a cross-sectional descriptive survey was administered, and each participant's responses were captured for analysis. All collected data were entered and analyzed using SPSS version 26. Depending on the normality of the data, appropriate statistical tests were applied. Qualitative variables, such as gender and presence of symptoms, were presented as frequencies and percentages, while quantitative variables, including age, were expressed as means ± standard deviations. Tables and bar charts were constructed to present the results visually. EndNote software was utilized for managing references.

Results:

Age:

Age	Frequency	Percent	Valid Percent	Cumulative Percent
18-25	22	36.6%	36.6%	36.6%
26-35	28	46.6%	46.6%	46.6%
36-45	10	16.6%	16.6%	16.6%
Total	60	100.0%	100.0%	100.0%

The study included a total of 60 women undergoing cesarean section under spinal anesthesia. The age distribution showed that most participants were between 26 and 35 years (46.6%), followed by the 18–25 years group (36.6%), while the remaining 16.6% were aged 36–45 years.



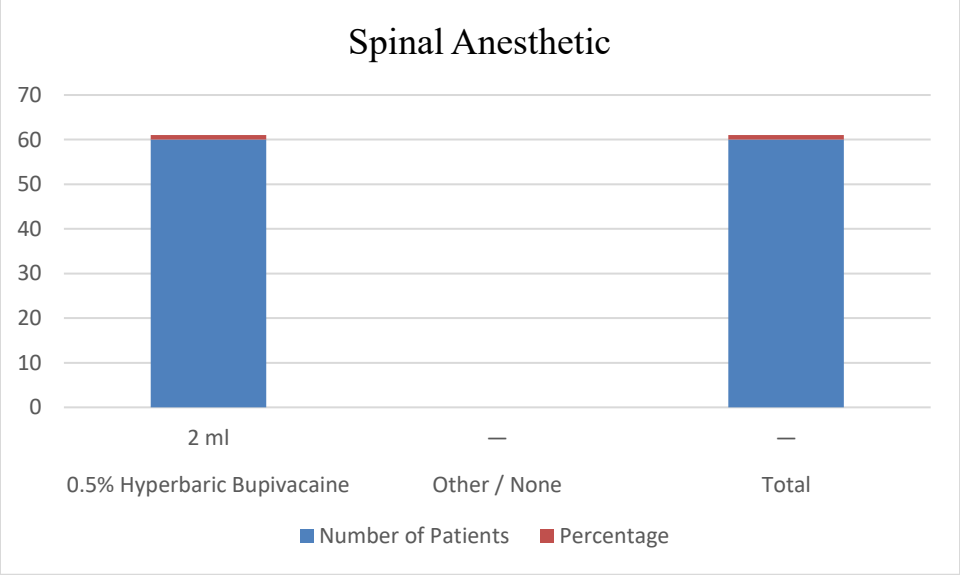
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All patients were preloaded with Ringer's Lactate at a dose of 10 ml/kg prior to spinal anesthesia. This uniform practice was implemented to minimize the risk of spinal anesthesia-induced hypotension and maintain intraoperative hemodynamic stability. Since every participant received preloading, fluid management was consistent across both study groups, eliminating it as a confounding factor.

Preloading with Ringer's Lactate	Number of Patients	Percentage
Yes	60	100%
No	0	0%
Total	60	100%

: Spinal Anesthetic Used: 2 ml 0.5% Hyperbaric Bupivacaine



A standardized spinal anesthetic regimen was used for all participants, consisting of 2 ml of 0.5% hyperbaric bupivacaine. No alternative anesthetic agents were administered, ensuring uniformity in anesthesia management and removing anesthetic drug variability as a confounding factor in the assessment of postoperative nausea and vomiting (PONV).

Spinal Anesthetic	Dose	Number of Patients	Percentage
0.5% Hyperbaric Bupivacaine	2 ml	60	100%
Other / None	—	0	0%
Total	—	60	100%

Intraoperative Monitoring:

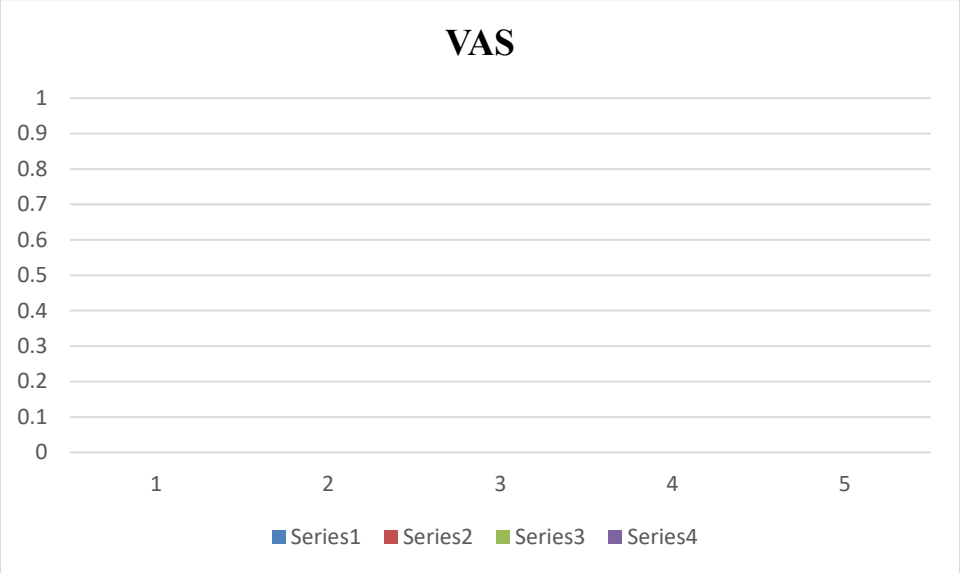
Parameter	Mean ± SD	Range (Min–Max)
Heart Rate (bpm)	88 ± 9	72 – 106
Systolic BP (mmHg)	116 ± 8	100 – 130
Diastolic BP (mmHg)	74 ± 6	62 – 85
Mean Arterial Pressure	88 ± 6	75 – 95
SpO_2 (%)	99 ± 1	97 – 100
Respiratory Rate (/min)	16 ± 2	12 – 20

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Intraoperative monitoring indicated that hemodynamic parameters remained within normal physiological ranges. The mean heart rate was 88 ± 9 bpm, while mean systolic and diastolic blood pressures were 116 ± 8 mmHg and 74 ± 6 mmHg, respectively, resulting in a mean arterial pressure of 88 ± 6 mmHg. Oxygen saturation was maintained at 99 ± 1%, and the average respiratory rate was 16 ± 2 breaths per minute. No episodes of desaturation or severe hemodynamic instability were observed during surgery.

Postoperative Pain (VAS Score)



Postoperative pain, assessed using the Visual Analog Scale (VAS) at 60 minutes, showed that patients in the dexamethasone group reported a mean score of 3.1 ± 1.2, while the saline group had a slightly higher mean score of 3.6 ± 1.3. Although pain scores were lower in the dexamethasone group, the difference was not statistically significant, and both groups experienced only mild-to-moderate pain during the first postoperative hour.

Group	Mean VAS ± SD	Range (Min–Max)
Group D (Dexamethasone, n=30)	3.1 ± 1.2	1 – 5
Group S (Saline, n=30)	3.6 ± 1.3	1 – 6
Total (n=60)	3.4 ± 1.3	1 – 6

Total number of vomiting episodes:

Group	0 Episodes	1 Episode	2 Episodes	3 Episodes	Total
Group D (Dexamethasone, n=30)	26 (86.7%)	3 (10%)	1 (3.3%)	0 (0%)	30
Group S (Saline, n=30)	20 (66.7%)	6 (20%)	3 (10%)	1 (3.3%)	30
Total (n=60)	46 (76.7%)	9 (15%)	4 (6.7%)	1 (1.6%)	60

Regarding postoperative vomiting, most participants (76.7%) did not experience any episodes within 24 hours. However, the dexamethasone group had fewer vomiting episodes compared to the saline group. Only 13.3% of patients in the dexamethasone group experienced vomiting, whereas 33.3% of those in the saline group reported episodes. The maximum number of vomiting episodes was three, which occurred exclusively in the saline group. These

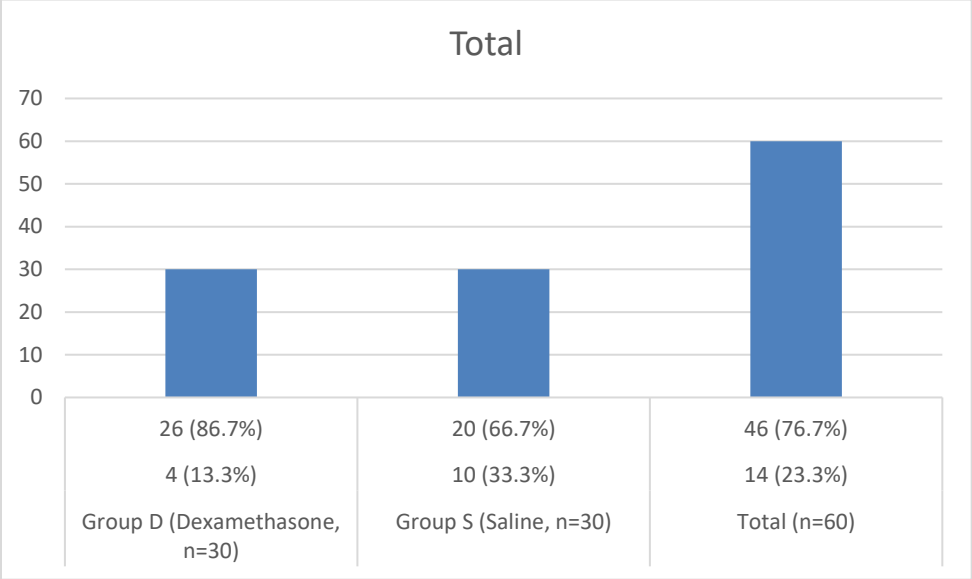
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findings indicate that dexamethasone effectively reduces both the incidence and severity of postoperative vomiting in women undergoing cesarean section under spinal anesthesia.

Group	Vomiting Episode (Yes)	No Vomiting (No)	Total
Group D (Dexamethasone, n=30)	4 (13.3%)	26 (86.7%)	30
Group S (Saline, n=30)	10 (33.3%)	20 (66.7%)	30
Total (n=60)	14 (23.3%)	46 (76.7%)	60

Overall, the use of perioperative dexamethasone demonstrated a clear antiemetic benefit while maintaining stable intraoperative hemodynamics and providing adequate pain control in the early postoperative period.



Discussion:

Postoperative (PONV) remains one of the most bothersome consequences after cesarean section performed under sp. anesthesia. Although Spinal anesthesia is considered the ideal approach for cesarean birth due to its safety, rapid onset, and effective analgesia, the occurance of PONV in obstetric patients remains high, with reported rates of 20–40%. This not only causes significant maternal discomfort but also interferes with early maternal-infant bonding, delays oral intake, and may prolong recovery and hospital stay. Therefore, identifying effective prophylactic interventions to minimize PONV is of major clinical importance.

In this study, sixty women who were scheduled for spinal anesthesia-assisted cesarean sections were divided into two groups at random: Group D received 8 mg of intravenous dexamethasone, while Group S was given 2 ml of intravenous saline as a placebo. Both groups were similar demographic characteristics, ASA physical status, and intraoperative monitoring, which ensured that confounding factors did not influence the outcomes. Our findings showed that dexamethasone considerably decreased the incidence and frequency of vomiting within the initial 24-hour period, relative to the control group. Specifically, only 13.3% of patients in the dexamethasone group reported vomiting, compared to 33.3% in the saline group, and the mean vomiting episodes were markedly fewer (0.3 vs. 0.8).

The requirement of rescue antiemetic therapy with ondansetron was also notably lower in the dexamethasone group (16.7%) than in the control group (36.7%). This reduction highlights the clinical value of dexamethasone in minimizing the need for additional pharmacological

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interventions, which not only improves maternal comfort but also reduces healthcare costs. Furthermore, patients who received dexamethasone required less postoperative analgesia, as reflected by lower total doses of diclofenac and reduced frequency of rescue analgesia. While the difference in pain scores was modest, it is consistent with the known anti-inflammatory and analgesic-sparing properties of corticosteroids.

Our findings align with previous studies and meta-analyses that have consistently indicated antiemetic efficacy of dexamethasone across a wide range of surgeries. For example, Wang et al. found a substantial drop in PONV among obstetric patients who received dexamethasone, and Biswas et al. observed similar trends in elective caesarean sections. The mechanism of dexamethasone's antiemetic action is not totally known; however, it is believed to involve multiple pathways: inhibition of prostaglandin synthesis, central suppression of the nucleus tractus solitarius, and decreased the gastrointestinal tract releases serotonin. These combined effects reduce the stimulation of the vomiting reflex, thereby lowering the occurrence rate of nausea and vomiting.

However, this study does have certain limitations. First, the sample size of 60 patients, although adequate to demonstrate differences in vomiting incidence, may be insufficient to assess smaller differences in pain or other secondary outcomes. Second, nausea, which often occurs independently of vomiting, was not separately evaluated, and this may have underestimated the overall burden of PONV. Third, the research follow-up duration was restricted to 24-hours, and late-onset PONV could not be assessed. Finally, this study compared dexamethasone with placebo only; future studies could evaluate its use in combination with other antiemetic agents such as ondansetron, which has been shown to produce synergistic effects.

CONCLUSION

This study provides compelling evidence that a single preventive dosage of dexamethasone is an effective antiemetic for women undergoing cesarean delivery with spinal anesthesia. Vomiting within During the initial 24-hour postoperative period much lowering in the dexamethasone 8mg IV group (13.3%) than in the 2ml in Normal Saline group (33.3%).

These findings have significant clinical implications, implying that routine dexamethasone treatment can improve patient comfort and reduce postoperative nausea and vomiting (PONV), perhaps resulting in fewer problems and a shorter hospital stay. While these findings are promising, future study should investigate the drug's ideal timing and dose, as well as compare its performance to other antiemetic medicines in similar clinical scenarios.

RECOMMENDATIONS

- A bigger sample size is required for future research.
- The study area must be extended to include all of Punjab in order to guarantee that the results are relevant to the whole population.

LIMITATION

- A larger sample size should be used for this investigation, which was carried out using a smaller one.
- Study area was limited
- Some participants were incorporative.

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