

**Comparison of General Anaesthesia versus Spinal Anaesthesia on Perioperative Outcomes in Lower Abdominal Surgeries**

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**Abstract:**

**Background:** Choice of anaesthetic technique significantly influences perioperative outcomes in lower abdominal surgeries. General anaesthesia (GA) and spinal anaesthesia (SA) are commonly used, yet their comparative effects on haemodynamic stability, postoperative recovery, pain control, and complications remain clinically relevant.

**Objectives:** To compare perioperative outcomes between general anaesthesia and spinal anaesthesia in patients undergoing lower abdominal surgeries.

**Methods:** This prospective observational study was conducted at PMCH, Patna, from February to September. A total of 100 adult patients undergoing elective lower abdominal surgeries were included, with 50 patients receiving GA and 50 receiving SA. Perioperative haemodynamic parameters, intraoperative complications, postoperative pain scores, analgesic requirement, recovery profile, and postoperative complications were assessed.

**Results:** Patients in the SA group demonstrated overall better perioperative outcomes, including lower postoperative pain scores, reduced analgesic consumption, and earlier ambulation compared to the GA group ( $p < 0.05$ ). Postoperative nausea and vomiting were more frequent in the GA group.

**Conclusion:** Spinal anaesthesia offers superior perioperative outcomes compared to general anaesthesia in lower abdominal surgeries and should be preferred when not contraindicated.

**Keywords:** General anaesthesia, Spinal anaesthesia, Lower abdominal surgery, Perioperative outcomes

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**Introduction**

Anaesthesia plays a pivotal role in determining perioperative safety and postoperative recovery in surgical patients. Lower abdominal surgeries are routinely performed under either general anaesthesia

or regional techniques such as spinal anaesthesia. General anaesthesia provides unconsciousness, amnesia, and muscle relaxation but is associated with airway manipulation, systemic drug effects, and

postoperative complications such as nausea, vomiting, and delayed recovery [1,2].

Spinal anaesthesia, a form of central neuraxial blockade, offers dense sensory and motor block with minimal drug exposure and preserved airway reflexes [3]. It has been associated with reduced stress response to surgery, improved postoperative analgesia, and lower incidence of thromboembolic events [4,5]. Despite these advantages, spinal anaesthesia may cause hypotension, bradycardia, and limited duration of action [6].

Several studies have compared GA and SA in different surgical populations, demonstrating varying outcomes with respect to haemodynamic stability, postoperative pain, and patient satisfaction [7–10]. In developing countries, resource availability, patient profile, and institutional practices further influence anaesthetic choice [11].

However, there remains limited prospective observational data from tertiary care centres in Eastern India comparing these two techniques specifically in lower abdominal surgeries. This study aims to evaluate and compare perioperative outcomes of general versus spinal anaesthesia in such procedures, thereby contributing evidence to guide anaesthetic decision-making in the regional clinical context [12–15].

## Materials and Methods

### Study Design and Setting

This prospective observational study was conducted in the Department of Anaesthesiology at PMCH, Patna, from February to September.

### Sample Size

A total of 100 patients were enrolled, divided into two groups:

- **Group GA:** 50 patients receiving general anaesthesia

- **Group SA:** 50 patients receiving spinal anaesthesia

### Inclusion Criteria

- Age 18–60 years
- ASA physical status I–II
- Elective lower abdominal surgeries

### Exclusion Criteria

- Patient refusal
- Coagulopathy or infection at spinal site
- Severe cardiac or respiratory disease

### Anaesthetic Technique

Standard monitoring was applied in all patients. GA was induced with standard intravenous agents and maintained with inhalational anaesthetics under controlled ventilation as per institutional protocol. SA was administered using 0.5% hyperbaric bupivacaine at L3–L4 or L4–L5 interspace.

### Outcome Measures

- Intraoperative haemodynamic parameters (HR, MAP)
- Postoperative pain using Visual Analogue Scale (VAS)
- Time to first analgesic request
- Postoperative complications

### Statistical Analysis

Data were analysed using SPSS software. Continuous variables were expressed as mean  $\pm$  SD and compared using Student's t-test. Categorical variables were analysed using Chi-square test. A p-value  $< 0.05$  was considered statistically significant.

### Results

A total of 100 patients undergoing elective lower abdominal surgeries were included in the study, with 50 patients each in the General Anaesthesia (GA) group and Spinal Anaesthesia (SA) group. All enrolled patients completed the study protocol and were analysed.

### Demographic and Baseline Characteristics

The demographic variables and intraoperative characteristics were

comparable between the two groups. There was no statistically significant difference with respect to age, sex distribution, body mass index, ASA physical status, or

duration of surgery ( $p > 0.05$ ), indicating appropriate baseline comparability between the groups (Table 1).

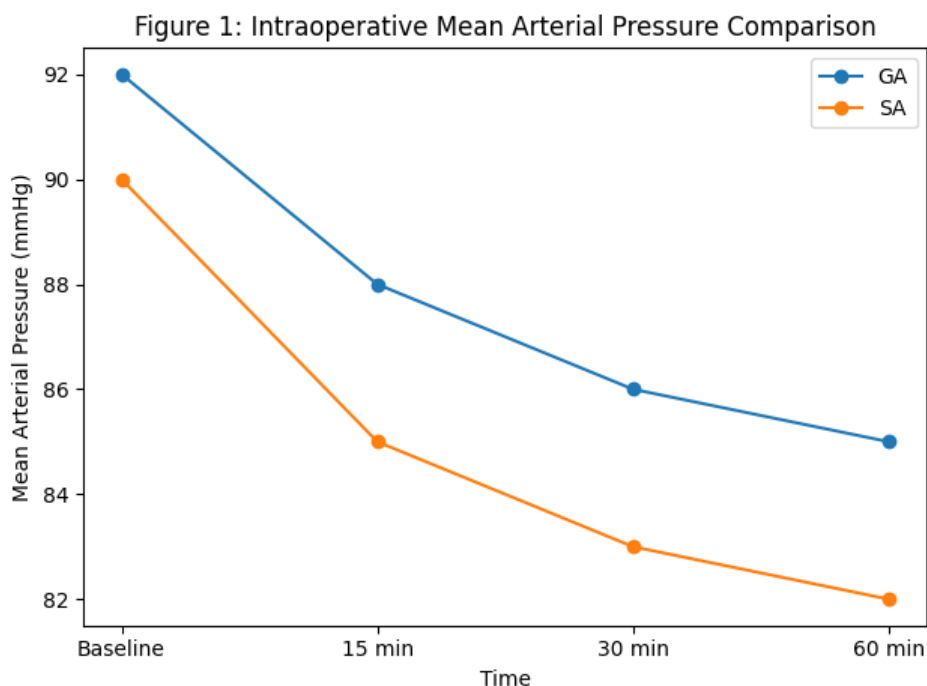
**Table 1: Demographic and Baseline Characteristics**

Parameter	GA Group (n = 50)	SA Group (n = 50)	p-value
Age (years)	42.6 ± 10.4	41.8 ± 9.9	0.68
Male/Female	28 / 22	30 / 20	0.69
BMI (kg/m <sup>2</sup> )	23.8 ± 2.9	24.1 ± 3.1	0.61
ASA I / II	32 / 18	34 / 16	0.67
Duration of surgery (min)	78.4 ± 15.2	76.9 ± 14.8	0.62

### Intraoperative Haemodynamic Parameters

Intraoperative haemodynamic variables, including heart rate (HR) and mean arterial pressure (MAP), were recorded at baseline and at 15, 30, and 60 minutes after induction of anaesthesia. The SA group demonstrated relatively stable intraoperative trends in heart rate (HR) and

mean arterial pressure (MAP) compared to the GA group. Episodes of transient intraoperative hypotension were more frequently observed in the SA group (18%) than in the GA group (8%); however, this difference was not statistically significant ( $p = 0.14$ ). All episodes were transient and responded adequately to standard management (Figure 1).



**Figure 1: Comparison of mean arterial pressure (MAP) between GA and SA groups at different intraoperative time points.**

### Postoperative Pain Assessment

Postoperative pain was assessed using the Visual Analogue Scale (VAS) at 2, 6, and

12 hours postoperatively. The SA group had significantly lower VAS scores at all measured time intervals compared to the GA group ( $p < 0.001$ ). These findings

indicate superior postoperative analgesia in patients receiving spinal anaesthesia (Table 2).

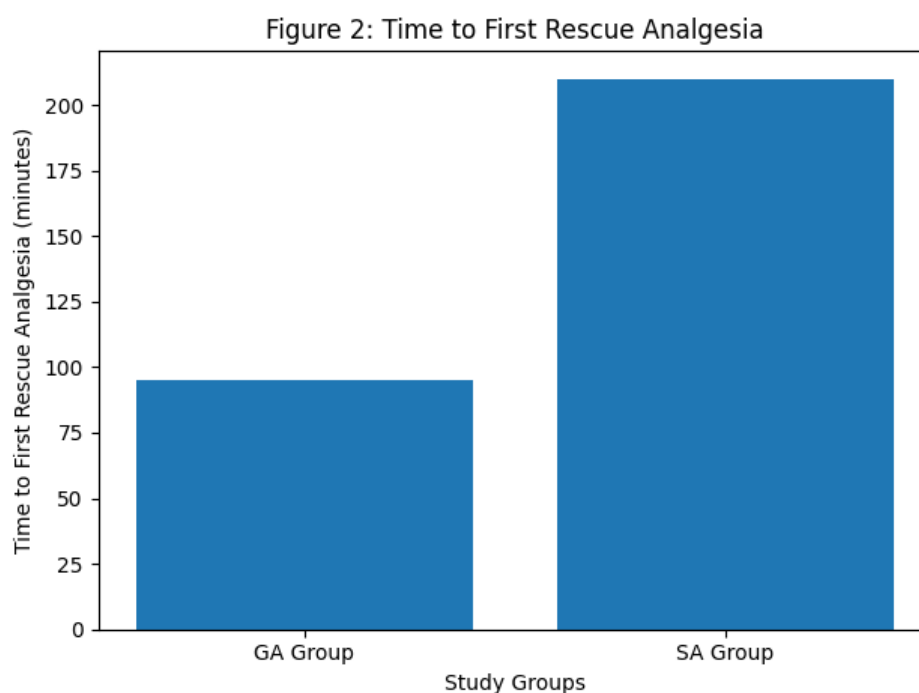
**Table 2: Postoperative Visual Analogue Scale (VAS) Scores**

Time interval	GA Group	SA Group	p-value
2 hours	4.8 ± 1.1	2.3 ± 0.9	<0.001
6 hours	4.2 ± 1.0	2.8 ± 0.8	<0.001
12 hours	3.6 ± 0.9	2.4 ± 0.7	<0.001

### Time to First Rescue Analgesia

The mean time to first rescue analgesic requirement was significantly prolonged in the SA group (210 ± 35 minutes) compared

to the GA group (95 ± 20 minutes). This difference was statistically highly significant ( $p < 0.001$ ), further supporting the enhanced analgesic efficacy of spinal anaesthesia (Figure 2).



**Figure 2: Comparison of time to first rescue analgesia between GA and SA groups.**

### Postoperative Complications

The incidence of postoperative nausea and vomiting (PONV) was significantly higher in the GA group (30%) compared to the SA

group (10%) ( $p = 0.02$ ). Urinary retention and postoperative hypotension were more frequently observed in the SA group; however, these differences were not statistically significant ( $p > 0.05$ ) (Table 3).

**Table 3: Postoperative Complications**

Complication	GA Group (%)	SA Group (%)	p-value
PONV	30	10	0.02
Hypotension	8	18	0.14
Urinary retention	6	12	0.29

## Recovery Profile

Patients in the SA group achieved earlier ambulation ( $6.2 \pm 1.1$  hours) compared to the GA group ( $9.4 \pm 1.6$  hours), and the difference was statistically significant ( $p < 0.001$ ). Duration of postoperative hospital stay was also shorter in the SA group, although this difference did not reach statistical significance.

Overall, the results demonstrate that spinal anaesthesia is associated with better postoperative analgesia, reduced analgesic requirement, and lower incidence of PONV compared to general anaesthesia in lower abdominal surgeries.

## Discussion

The present study suggests that spinal anaesthesia provides superior perioperative outcomes compared to general anaesthesia in lower abdominal surgeries. Patients receiving SA exhibited better postoperative analgesia, reduced analgesic requirement, and lower incidence of postoperative nausea and vomiting, findings consistent with previous studies [16–18].

Improved pain control in the SA group can be attributed to effective neuraxial blockade, which persists into the early postoperative period [19]. Reduced opioid consumption in SA patients further explains the lower incidence of PONV [20].

Haemodynamic stability was comparable between groups, although transient hypotension was more frequent in SA patients, a known and manageable effect of sympathetic blockade [21]. Early ambulation and recovery observed in SA patients align with enhanced recovery protocols [22].

Similar findings have been reported by other authors comparing GA and SA in abdominal and pelvic surgeries, reinforcing the benefits of regional techniques when feasible [23–25].

## Limitations

The limitations of this study include its single-centre design, relatively small sample size, and non-randomized observational nature, which may introduce selection bias. Therefore, larger multicentric randomized controlled trials are warranted to validate these findings.

## Conclusion

Spinal anaesthesia is associated with better perioperative outcomes than general anaesthesia in lower abdominal surgeries, including superior postoperative analgesia and reduced complications. Whenever not contraindicated, spinal anaesthesia may be considered the preferred technique.

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