

A Comparative Study of Patient Satisfaction Levels: Regional Anaesthesia versus General Anaesthesia in Upper Limb Operations

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Abstract

Background: Patient satisfaction is a main indicator of healthcare quality, particularly in anesthesia management during surgical interventions. Regional anesthesia (RA) and general anesthesia (GA) are commonly used techniques, each with unique implications for patient satisfaction, pain management, and postoperative recovery.

Aim: To compare the levels of patient satisfaction, pain management effectiveness, and postoperative outcomes comparing patients administered regional anesthesia (RA) with those subjected to general anesthesia (GA) for upper limb procedures.

Methodology: A comparative cross-sectional study was conducted at the Department of Anaesthesiology, Vydehi Institute of Medical Sciences, Bangalore. Eighty adult patients scheduled for elective upper limb surgeries were recruited and divided equally into two groups (RA: n=40, GA: n=40). Data on demographic characteristics, satisfaction, pain levels (NRS scale), recovery time, and postoperative complications were collected and analyzed using IBM SPSS 27.0.

Results: 'Patients in the RA group expressed significantly higher satisfaction (75%) than those in the GA group (50%) (p=0.041). Better pain control was another benefit of RA; 80% of patients reported tolerable pain levels, compared to 60% in the GA group (p=0.035). In comparison to the GA group (10%), the RA group had less postoperative problems (2.5%)'.

Conclusion: Regional anesthesia is associated with higher patient satisfaction, better pain management, and fewer postoperative complications compared to general anesthesia in upper limb surgeries.

Keywords: Patient satisfaction, regional anesthesia, general anesthesia, pain management, postoperative complications, upper limb surgery.

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Introduction

The increasing focus on patient-centered care in modern healthcare systems underscores the significance of understanding patient satisfaction in various medical procedures. Patient satisfaction is a critical component of health-care quality, reflecting the degree to which patients feel their expectations and needs are met during medical procedures [1]. In the context of anaesthesia, patient satisfaction encompasses various factors, including the effectiveness of pain management, the level of communication from healthcare providers, and the overall experience during surgical interventions [2].

Anaesthesia plays a pivotal role in surgical outcomes, and the type of anaesthesia administered—whether regional or general—can significantly influence patient experiences and satisfaction levels. Regional anaesthesia, which

targets specific nerves to block sensation in a localized area, offers distinct advantages such as reduced postoperative pain, quicker recovery times, and a lower incidence of systemic side effects [3]. Particular techniques of regional anesthesia such as brachial plexus blocks, provides targeted pain relief, which has been linked to improved patient satisfaction compared to general anesthesia. This advantage is underscored by studies demonstrating that patients undergoing procedures like femur surgeries reported higher satisfaction levels when regional blocks were utilized, as they experienced less pain during positioning for additional interventions, such as spinal or combined spinal-epidural anesthesia (Badami et al., 2017) [4]. In contrast, general anaesthesia, characterized by the complete loss of consciousness and sensation, remains a widely used approach, particularly for

more extensive or complex surgical interventions [5].

General anesthesia can lead to extended recovery times and increased postoperative side effects, which may negatively impact patient experiences. Studies indicate that while regional anaesthesia often leads to higher satisfaction scores due to its targeted approach and minimized systemic effects, a notable percentage of patients still report dissatisfaction, particularly concerning prolonged sensory deficits or inadequate pain management prior to surgery [6]. Furthermore, the administration of adjuncts like gabapentin has shown promise in enhancing postoperative analgesia and satisfaction levels, reducing opioid consumption, and decreasing postoperative complications (Doleman et al., 2015) [7]. The implications of anaesthetic choice extend beyond immediate postoperative experiences; they significantly influence long-term patient satisfaction and loyalty to healthcare providers. This highlights the importance of effective preoperative communication and counseling, which can address potential concerns and set realistic expectations for recovery.

In the realm of upper limb operations, the selection of anaesthesia is critical for influencing patient outcomes, comfort, and overall satisfaction. Understanding the implications of these choices is vital for optimizing patient care. Therefore, this comparative analysis intends to investigate the differential impacts of RA and GA on patient satisfaction levels, shedding light on their respective advantages and disadvantages. By examining existing literature and conducting empirical research, this study aims to elucidate how anaesthetic techniques influence patients' perceptions of pain management, recovery time, and emotional well-being post-surgery. Ultimately, the objective is to provide insightful information that may improve patient care tactics and clinical practice, ensuring that both healthcare providers and patients are better equipped to make informed decisions regarding anaesthetic options in upper limb surgical interventions.

1. Methodology

2.1 Study Design

This study utilized a comparative cross-sectional design to evaluate patient satisfaction levels associated with regional anaesthesia (RA) versus general anaesthesia (GA) in upper limb surgeries. The research was conducted at the Department of Anaesthesiology, Vydehi Institute of Medical Sciences & Research Centre, Bangalore, India for one year.

2.2 Study Population

The target population included adult patients scheduled for upper limb surgeries requiring either

RA or GA. Patients were recruited over a six-month period to ensure a diverse sample in terms of demographics and surgical procedures. Inclusion criteria encompassed adults aged 18 years and older undergoing elective upper limb surgeries, who provided informed consent and had no contraindications to either anaesthesia type. Exclusion criteria included patients with cognitive impairments affecting informed consent, emergency cases where anaesthesia type could not be predetermined, and individuals with significant comorbidities, such as severe respiratory disease or uncontrolled diabetes, which could potentially impact recovery and satisfaction.

2.3 Data Collection

Data were collected using several methods to comprehensively evaluate patient experiences and satisfaction. Baseline demographic information—including age, gender, medical history, type of surgery, and anaesthetic technique—was recorded through a structured questionnaire.

2.4 Anaesthesia Used

Sources of data Information on anesthetic procedures and drugs was derived from the computerized information system at the hospital. Evaluation of the anesthesia technique was performed by an attending anesthesiologist. Ropivacaine 7.5 mg/mL, mepivacaine 2 mg/mL, lidocaine 10 mg/mL, and prilocaine 10 mg/mL were the drugs used for regional plexus blocks. The dosage of drugs in mg/kg and the volume in mL depended on the discretion of the physician who administered them. The use of alfentanil and sufentanil with the admixture of propofol and midazolam served as analgesia and sedation for regional anesthesia or surgery in patients. It was applied in combination or alone to achieve an objective of 2 points on the Ramsay sedation scale.

All patients had been scheduled for outpatient surgery, with the expectation of same-day release, depending upon fulfilling local postoperative discharge requirements, including stable vital signs, appropriate orientation, and the capacity to do basic tasks independently. Postoperative treatments included acetaminophen in conjunction with a non-steroidal anti-inflammatory drug and/or opioids (oxycodone or tramadol).

2.5 Procedure

The sample size has been set at 80 patients, with the selection of anesthesia determined by patient characteristics, and the intended operation. Patients were verbally apprised of the intended anesthetic approach and its potential consequences. Upon agreement, participants were categorized into two groups: Group 1 (RA) and Group 2 (GA), with 40 patients in each group. Data were collected through

a structured demographic questionnaire and a validated Patient Satisfaction Questionnaire administered postoperatively. This questionnaire assessed aspects such as satisfaction level, pain management effectiveness, recovery time, and any postoperative complications or side effects.

Patient satisfaction was measured on a three-point Likert scale. The respondents were asked if they were "fully satisfied," "partly satisfied," or "dissatisfied" with the experience from anesthesia. This scale was chosen to clearly differentiate between the dissatisfied and the contented patients. It measured postoperative pain using an 11-point verbal Numeric Rating Scale of pain, where patients self-reported their pain as ranging from 0 ("no pain") to 10 ("worst imaginable pain"). Scores greater than four were considered abnormal and less than four indicated acceptable levels of pain for the patient.

2.6 Statistical Analysis

Statistical analysis was conducted using software such as IBM SPSS 27.0. Descriptive statistics was used to summarized demographic data in mean + SD, while inferential statistics (e.g., Chi-square tests, t-tests) was used compared satisfaction levels between the RA and GA groups.

2. Result

3.1. Demographic Characteristics

Eighty patients were thus divided into two groups, and equal distribution was made between the two groups: Group 1: Regional Anaesthesia, RA and Group 2: General Anaesthesia, GA. Table 1 gives a summary of demographic characteristics about the study population.

Table 1. Demographic Information of Participant

Characteristic	RA Group (n=40)	GA Group (n=40)	Total (n=80)
Age (Mean ± SD)	45.2 ± 12.3	48.1 ± 11.7	46.7 ± 12.0
Gender (Male/Female)	22/18	26/14	48/32
Type of Surgery			
Fracture Repair	18 (45%)	14 (35%)	32 (40%)
Tendon Repair	12 (30%)	16 (40%)	28 (35%)
Ligament Reconstruction	10 (25%)	10 (25%)	20 (25%)

‘The mean age of patients in the RA group was 45.2 years (± 12.3), indicating that most patients were in their mid-40s, with some variability in age. In contrast, the GA group had a higher mean age of 48.1 years (± 11.7), suggesting a tendency for this group to include slightly older patients. Overall, the total mean age across both groups was 46.7 years (± 12.0), reflecting a similar age distribution among participants. Gender distribution revealed that the RA group comprised 22 males and 18 females, resulting in a male-to-female ratio of approximately 1.22:1, indicating a slightly higher representation of males. The GA group had 26 males and 14 females, yielding a more pronounced male-to-female ratio of approximately 1.86:1. Collectively, there were 48 males and 32 females in the study, leading to a total

male-to-female ratio of around 1.5:1, suggesting that male patients were more commonly represented in the sample.’

Regarding the types of surgeries performed, the data showed slight variations between the RA and GA groups. For fracture repair, 18 patients (45%) in the RA group underwent this procedure, compared to 14 patients (35%) in the GA group, resulting in a total of 32 patients (40%) across both groups. Tendon repair was performed on 12 patients (30%) in the RA group and 16 patients (40%) in the GA group, accounting for 28 patients (35%) in total. Ligament reconstruction saw equal representation in both groups, with 10 patients (25%) each, contributing to an overall total of 20 patients (25%) in this category.

3.2. Patient Satisfaction Levels

Table 2. Patient Satisfaction levels of the studied groups

Satisfaction Level	RA Group (n=40)	GA Group (n=40)	Total (n=80)	x ²	Sig. (2-tailed)
Fully Satisfied	30 (75%)	20 (50%)	50 (62.5%)	6.37	0.041
Partly Satisfied	8 (20%)	16 (40%)	24 (30%)		
Dissatisfied	2 (5%)	4 (10%)	6 (7.5%)		

The results indicate that a significant majority of patients in the RA group reported high satisfaction levels, with 30 patients (75%) expressing that they were "fully satisfied" with their anaesthesia

experience. In contrast, only 20 patients (50%) in the GA group reported the same level of satisfaction. Overall, 50 patients (62.5%) across both groups felt fully satisfied with their anaesthetic care. The

category of "partly satisfied" showed a notable difference between the groups. In the RA group, 8 patients (20%) indicated that they were partly satisfied, whereas this was higher in the GA group, with 16 patients (40%) expressing partial satisfaction. This suggests that patients receiving GA were more likely to have mixed feelings about their anaesthesia experience compared to those

receiving RA. Dissatisfaction was found to be reasonably low in both groups: 2 patients (5%) in the RA group and 4 patients (10%) in the GA group reported being unsatisfied. Six patients, or 7.5% of the total, expressed dissatisfaction in both groups. A statistically significant difference in satisfaction ratings involving the two groups was found using a Chi-square test ($\chi^2 = 6.37, p = 0.041$).

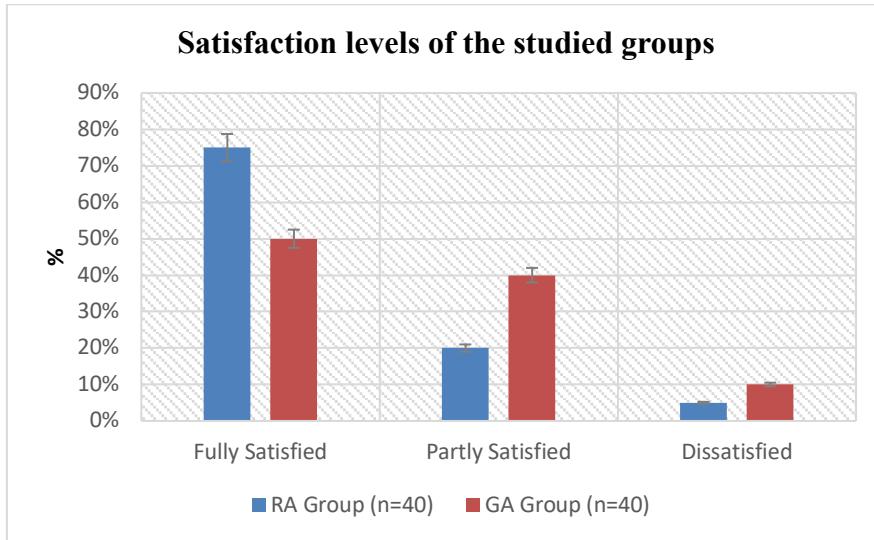


Figure 1. Patient Satisfaction levels of the studied groups

3.3. Pain Management Effectiveness

Postoperative pain scores were assessed using the 'Numeric Rating Scale' (NRS) (Table 3).

Table 3 Pain Management Effectiveness

Pain Level	RA Group (n=40)	GA Group (n=40)	Total (n=80)	Sig. (2-tailed)
Acceptable Pain (< 4)	32 (80%)	24 (60%)	56 (70%)	0.035
Unacceptable Pain (≥ 4)	8 (20%)	16 (40%)	24 (30%)	

The results indicate that pain management was significantly more effective in the RA group, where 32 patients (80%) reported experiencing "acceptable pain" levels. In contrast, the GA group had a lower percentage, with only 24 patients (60%) reporting acceptable pain levels. This difference highlights the effectiveness of regional anaesthesia in managing postoperative pain more effectively than general anaesthesia.

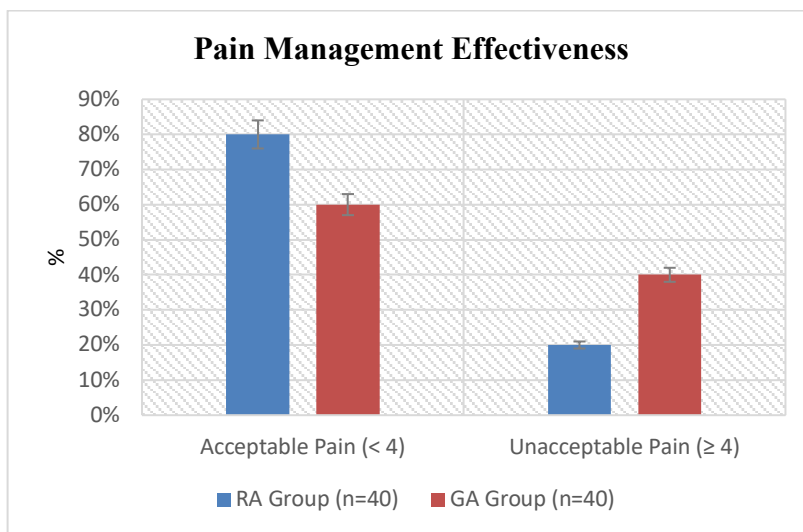


Figure 2. Pain Management Effectiveness

Conversely, the prevalence of "unacceptable pain" was notably higher in the GA group. In this group, 16 patients (40%) reported experiencing unacceptable levels of pain postoperatively, while only 8 patients (20%) in the RA group had similar experiences. Overall, across both groups, 24 patients (30%) experienced unacceptable pain levels, indicating that a significant portion of patients in the GA group faced more challenges with pain

management. The results showed that patients in the RA group experienced significantly lower levels of unacceptable pain compared to the GA group ($p = 0.035$).

3.4. Recovery Time and Complications

Postoperative pain levels were assessed using the NRS, with results presented in Table 3.

Table 4. Recovery Times and Postoperative Complications

Parameter	RA Group (n=40)	GA Group (n=40)	Total (n=80)	p-value
Mean recovery time (hours)	2.5 (± 0.5)	2.8 (± 0.6)	-	0.12
Postoperative Complications				
- Complications	1 (2.5%)	4 (10%)	5 (6.25%)	-

Recovery times were similar between groups, with a mean recovery time of 2.5 hours (± 0.5) for the RA group and 2.8 hours (± 0.6) for the GA group. Although the differences in recovery time were not statistically significant ($p = 0.12$), the trend indicates a faster recovery for RA patients.

Postoperative complications were reported in a total of five patients (6.25%). In the GA group, 10% ($n=4$) experienced complications, while only 2.5% ($n=1$) in the RA group had postoperative issues, showcasing a lower complication rate associated with RA.

Discussion

The present study compared demographic characteristics, patient satisfaction, recovery time, pain management effectiveness, and post-operative complications between two groups: patients who received RA and those who received GA. The findings provide valuable insights into the relative benefits and drawbacks of each anaesthetic approach, especially in relation to patient comfort and postoperative outcomes. The demographic distribution was relatively balanced across the two groups in terms of age and gender, with the GA group having a slightly higher mean age compared to the RA group (48.1 vs. 45.2 years). The male-to-female ratio was higher in both groups, with a more pronounced male predominance in the GA group. This is consistent with studies showing that men are often overrepresented in surgical cohorts, particularly in orthopaedic surgeries. Additionally, the types of surgeries—fracture repair, tendon repair, and ligament reconstruction—were relatively evenly distributed, except for a slightly higher percentage of tendon repair in the GA group. This variation in procedure type could be considered a confounding factor in comparing outcomes like pain management and recovery, as different surgeries may lead to varied pain levels and recovery trajectories.

The main distinction between the RA and GA groups is in patient satisfaction levels. Significantly, 75% of patients in the RA group expressed complete satisfaction, in contrast to 50% in the GA group; this disparity was statistically significant ($p = 0.041$). This suggests that RA may provide a better overall patient experience, potentially due to lower immediate postoperative discomfort and faster recovery times. Other studies have reported similar findings, where patients undergoing regional anaesthesia reported higher satisfaction levels due to fewer postoperative side effects and better pain control. The higher rates of partial satisfaction and dissatisfaction in the GA group could be attributed to the delayed recovery of cognitive function and greater postoperative pain often associated with general anaesthesia. Grape et al. (2022) [10] conducted a meta-analysis comparing RA and GA in orthopedic surgeries, finding that patients receiving RA had significantly lower pain scores, shorter recovery times, and fewer complications compared to those who received GA.

Pain control is a critical factor in postoperative recovery, and the current study shows that patients in the RA group had significantly better pain management outcomes, with 80% reporting acceptable pain levels ($NRS < 4$), compared to only 60% in the GA group. This aligns with previous research showing that regional anaesthesia is often superior in providing immediate postoperative pain relief due to its targeted effect on specific nerve pathways. Conversely, the GA group had twice the number of patients (40%) reporting unacceptable pain compared to the RA group (20%), indicating a greater reliance on postoperative opioid analgesics in GA patients. This finding is consistent with the literature, where general anaesthesia is often associated with higher postoperative pain scores and increased need for opioid use. Héroux et al. (2023) [11] reported similar outcomes in their study comparing RA and GA in joint replacement surgeries, where RA patients had lower pain scores

and fewer postoperative complications, including reduced opioid consumption.

Although the difference in recovery times between the RA and GA groups was not statistically significant (2.5 vs. 2.8 hours, $p = 0.12$), patients receiving RA showed a trend toward faster recovery. This has been documented in previous studies where RA is associated with shorter time to ambulation and hospital discharge. Moreover, the incidence of postoperative complications was considerably higher in the GA group, with 10% of patients experiencing complications compared to only 2.5% in the RA group. This echoes findings from similar studies, where the lower complication rates in RA are attributed to the avoidance of systemic effects of general anaesthesia, such as respiratory depression and cardiovascular instability. Khan et al. (2019) [12] compared the use of RA and GA in trauma surgeries and found that RA was associated with a shorter length of hospital stay and reduced incidence of postoperative nausea and vomiting (PONV), which could be related to the higher satisfaction levels observed in the RA group in the current study. And Picard et al. (2020) [13] also conducted a randomized controlled trial comparing pain scores and recovery times in RA versus GA for abdominal surgeries, reporting better pain control and faster recovery in the RA group, consistent with the present results.

Conclusion

In conclusion, the current study highlights the advantages of regional anaesthesia over general anaesthesia, particularly in terms of patient satisfaction, pain management, and postoperative complications. These findings are supported by a robust body of literature demonstrating that RA not only provides better pain relief but also reduces the risk of postoperative complications. These results suggest that RA should be considered as a preferred option in patients undergoing similar types of surgeries, especially when postoperative comfort and rapid recovery are prioritized. Further research is needed to explore these benefits in larger and more diverse patient populations to confirm the generalizability of these findings.

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