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Original Research Article

Comparative Study of Preoperative Anxiety and Perioperative Outcomes Between General and Regional Anaesthesia Patients at a Tertiary Care Institute

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Abstract:

Background: It is well documented that surgical patients struggle with anxiety prior to surgery, and may be influenced by pain perception after surgery, patient recovery and their experience of surgery. Type of anaesthesia could effect on anxiety and peri-operative outcomes. The present study analyzed the differences between the peri-operative situation of two groups of patients – under general anaesthesia (GA) and under regional anaesthesia (RA) – in terms of their level of preoperative anxiety.

Objectives: To see how much anxiety there is in GA patients compared to RA patients, difference in pain after anaesthesia, need of analgesics, PONV, recovery time, hospital stay, recovery satisfaction and anaesthetic complications.

Materials and Methods: Comparative study of 120 surgical cases have been performed between the two January 2024 and December 2024 in Datta Meghe Medical College, Wanadongri, Nagpur. In all 60 patients were given GA and 60 were given RA. A pre-standardized anxiety questionnaire was used to evaluate pre-operative anxiety. Data pertaining to perioperative outcomes were recorded and compared between the two groups. A P value <0.05 was considered statistically significant.

Results: The admissions anxiety score was significantly higher in GA group compared to RA group. Patients had moderate-severe anxiety in 36.7% and 20.0%, respectively (P = 0.048). Postoperative pain at 6 hours was higher with GA (4.1 ± 1.3 vs. 2.8 ± 1.1; P < 0.001), with greater rescue analgesic use (61.7% vs. 35.0%; P = 0.004). The rates of postoperative nausea and vomiting (PONV) were 25.0% versus 10.0% (P = 0.032). Recovery time was longer with GA (42.6 ± 10.8 vs. 31.4 ± 8.7 minutes; P < 0.001). Hospital stay was comparable (3.8 ± 1.2 vs. 3.4 ± 1.0 days; P = 0.061), while satisfaction was higher with RA (88.3% vs. 73.3%; P = 0.034).

Conclusions: Regional anesthesia was associated with lower levels of anxiety prior to surgery, less postoperative pain or need for pain medications, fewer episodes of PNV, quicker recovery and more patient satisfaction than general anesthesia. In conclusion, the present results are suggestive of anesthetic technique as a relevant factor to be taken into account towards optimizing peri-operative outcomes.

Keywords: Preoperative Anxiety; General Anaesthesia; Regional Anaesthesia; Perioperative Outcomes; Postoperative Pain; Patient Satisfaction.

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Introduction

Surgical patients are frequently affected by anxiety. It can come from fears concerning the operations, predicted agony, uncertainty of the surgery's outcome, dread of a general anesthesia, inability to control circumstance and lack of familiarity with the hospital environment. As a preoperative anxiety, PONs would be more likely to increase heart rate, BP, SCT, postoperative pain, postoperative drug requirement, recovery and patient satisfaction depending upon the level of PONs [1]. The psychological responses have been influenced by previous surgical experiences, type of surgery performed, surgeon explained information to them and their personal characteristics [2]. An important aspect of this experience is anaesthesia and patients may have different perceptions and sometime a different expectation regarding the general anaesthetic and regional anaesthetic [3]. The regional anaesthetic will involve sensory and (with technique) motor blockade and in most cases the

patient will be awake, under 'general' anaesthetic which may include general anaesthetic and airway management. Previous research supported the hypothesis that time spent preparing for a patient's anaesthetic (pre-anaesthetic evaluation) and communication about anaesthetic would be associated, which might reduce anxiety and improve patient's peri-anaesthetic experience [4] .Previous studies indicated that there was a relationship between the amount of time spent preparing for a patient's anaesthetic (pre-anaesthetic assessment) and amount of communication with anaesthetic (time spent talking about anaesthetic), and this might minimize anxiety and improve patient's peri-anaesthetic experience [5]. This would be clinically significant - any differences, between this group of patients as they experience various anaesthetic modalities, would be important in this study.

The choice of general or regional anaesthetic will be influenced by a number of factors including the type of surgery, the patient's specific factors, postoperative pain, disease burden, ease/post-preference for the surgeon and patient preference. As well as successful surgical anaesthetic, the technique used could also affect the appearance of the postoperative period including the amount of opioid compared to reviving agent, haemodynamic steady point, time to recover and satisfaction factors affecting the patient [6–8]. In some circumstances however, regional anaesthetic and/or sedative drugs that achieve adequate pain relief without general analgesics may be more appropriate and, in these circumstances, may be superior to general incision and/or Risboak anaesthetic using general analgesics [9, 10] to avoid general anaesthetic and controlled use of the airway. The connection, however, between anaesthetic technique and anxiety prior to induction is not simple as demographic, psychological and procedural factors can impact the anxiety. Furthermore, some conflicting data for the relationship between general anaesthetic and regional anaesthetic with surgical outcomes from population-based studies in the operating room exist [10]. Therefore, a comparative evaluation is needed in the local tertiary-care environment. Therefore, the aim of the current study was to assess and compare the level of anxiety of patients before general anesthesias (GA) and before regional anesthesias (RA) along with the assessment of various perioperative outcomes before and after induction of both GA and RA such as pain, requirement of peri-operative analgesic, post-operative nausea and vomiting, length of stay in hospital, patient satisfaction with the patient and associated complications like hypotension at Datta Meghe medical college, Wanadongri, Nagpur from January 2024 till December 2024.

Materials And Methods

Comparative Observational Study was carried out at Datta Meghe Medical college, Wanadongri, Nagpur for one year (2024 January – 2024 December). The aim of this study was to compare the level of anxiety of adult patients in the preoperative period and their perioperative outcome after elective surgery under general anaesthetic (GA) versus regional anaesthetic (RA). 120 patients were included and divided by anaesthesia group into 60 patients in each group. Preoperative demographic and clinical information was collected from patients prior to surgery and patient anxiety was measured by administration of a standardized anxiety assessment scale. After anaesthetic, there were systematic observations of relevant parameters during and after the operation. Objectives included primary outcome of difference in preoperative anxiety between GA and RA groups, secondary outcomes were postoperative pain, requirement for rescue analgesic, postoperative nausea and vomiting (PONV), recovery time, hospital stay and patient satisfaction and anaesthesia related complications. Patient selection was done with a standard set of inclusion and exclusion criteria to ensure similarity in desired study groups. Data was recorded in real time supported by a structured study proforma, and then analyzed with relevant statistics. This study was done ethical protocols and informed consent were taken from all participants before joining the study. To preserve confidentiality patient identifiers were not included in the analytical data set. The comparative design allowed for the assessment of not only psychological, but also clinically relevant pre- and post-surgical differences of the two anaesthetic methods.

Study Design: This was an observational study of a comparative nature carried out in a tertiary care teaching hospital. The study compared two naturally occurring patient groups where the anaesthetic technique used for their scheduled surgical procedure happened to be either inhalation or total intravenous. The study compared 2 naturally occurring patient groups according to the administration of either inhalation or total intravenous anaesthetic technique for their scheduled surgical procedure. The GA group comprised patients who underwent surgery under general anaesthetic, and the RA group those who were receiving surgery under regional anaesthetic. The study was a formal sequence that included patient screening, patient eligibility, informed consent, baseline evaluation, evaluation of patient anxiety prior to the surgery, perioperative observation, evaluation after surgery, statistical comparison. The research period was from January 2024 to December 2024.

Study Population: This study was conducted on the adult patient samples for surgeries admitted to Datta Meghe Medical College, Wanadongri, Nagpur from

1st January to 31st December 2018. The 120 patients eligible for the analysis had predefined criteria.

The subjects were split into two half groups:

- Group II – Sedation/Analgesia (SA): 60 patients.
- Group II – Regional Anaesthesia (RA): 60 patients.

The baseline data such as age, gender, clinical and relevant long-term surgeries data were collected before surgery. Patients were assessed before induction of anaesthesia to ensure that the measures were assessing their state of anxiety just prior to the actual surgery. Then parameters were monitored and recorded postoperatively using fixed outcome measures.

Inclusion Criteria

If they met all of the following inclusion criteria they were eligible to participate:

- Adults 18 years of age and older.
- People who are to have an elective surgery.
- Patients were to be given either general or regional anaesthetic.
- Patients suitable for the planned anaesthetic procedure on a medical basis.
- Patients who can communicate appropriately and they are able to understand the anxiety assessment.
- Patients willing to participate and provide written informed consent.

Exclusion Criteria

Inclusion criteria did not apply to patients if any factor was present that could significantly affect the assessment of anxiety, peri-operative assessment or comparison of the two groups:

- Patients who are subjected to emergency surgery.
- Individuals who have high cognitive impairment or psychiatric deficits that might affect reliable rating of anxiety.
- Patients that are unable to communicate well and fully.
- Patients with the same surgical procedure, under both general and regional anaesthetic.
- Patients who do not have full pre/post records.
- Patients who refused to participate in or rescinded consent during the study.

Study Selection: Systematically selection of patients was executed throughout the study period. Patients were screened for eligibility in the first place, those who participated in elective surgery. Pre-enrollment demographic and clinical variables were reviewed and those whose data met the inclusion criteria who did not have exclusion criteria met were deemed to be eligible. Written informed consent was sought after providing explanation of the purpose and procedures of the study. The patients were divided into two groups: GA and RA, depending upon the technique of anaesthetic chosen and used as part of the usual clinical management of the patient. The total numbers of patients enrolled were 120 with 60 patients in each group. Preoperative anxiety was evaluated prior to general anaesthetic or regional anaesthetic. This time was chosen to reflect the anxiety surrounding the potential surgery and anaesthetic event.

Data Collection: Data was collected from using a structured proforma made for the study. Demographic and clinical data was collected at baseline prior to surgery. These included, age, sex, surgical characteristics, and anaesthetic technique. Anxiety level before anaesthetic was taken was measured using a standard anxiety assessment scale. The level of anxiety was recorded for each patient and then compared with the GA and RA patients. Pre-, intra-, and postoperative observations and parameters of anaesthesia were documented. Patients were evaluated for postoperative pain, need for rescue analgesic, PONV, recovery time and other clinically relevant complications after surgery. The pain was assessed by standardized pain scoring and comparison made between 6 hours after surgery (the main assessment) and preoperatively. Incidence of PONV was noted when the patients complained of and/or complained about clinically observed nausea and/or vomiting during the postoperative evaluation. The need for rescue analgesic (RA) was recorded as the need for extra analgesic after primary intraoperative analgesic administration. The recovery time was defined as the time needed to the patient to achieve the defined postoperative recovery status.

Outcome Measures: The main finding was the findings of the difference between the general patients and the patients which received general anaesthetic and the patients which were given regional anaesthetic in the case of patients' level of preoperative anxiety. Patients' mean anxiety score as well as those with moderate to severe anxiety levels were matched between the two groups.

Secondary outcomes were:

1. Postoperative pain: Pain intensity at 6 hours after the surgery was compared between the groups (GA versus RA).
2. Additional postoperative analgesia requirement assessed: Proportion that required additional postoperative analgesia.
3. Postoperative nausea and vomiting: The rates of PONV in the two anaesthetic groups were compared.
4. Time for postoperative recovery: The postoperative recovery time was recorded and compared.
5. Hospital stay: Days spent in the hospital from admission until discharge was assessed.

The outcomes were chosen to enable a comprehensive evaluation of the psychological, symptomatic, recovery and patient-reported outcomes of the two methods of anaesthetic administration.

Statistical Analysis: Data gathered were systematically coded and analysed using proper statistical methods. Data were summarized as mean ± SD (Categorical variables as frequency and percentages). To assess the comparability between the GA and RA groups, baseline characteristics were explored. An independent-samples t-test was chosen for continuous variables that met the assumptions of parametric analysis to compare variables as anxiety scores, postoperative pain scores, recovery time, and length of hospital stay. The chi-square test or Fisher's exact test was used to compare categorical variables as appropriate (moderate to severe anxiety, requirement for rescue analgesic, PONV, patient satisfaction and anaesthesia-related complications). Both the size and direction of the difference between the two groups was taken into account together with its statistical significance. Measurement errors for the questionnaires were avoided and the two-sided P value was <0.05. Data were analyzed and presented in the following manner to allow comparison between the GA and RA groups: Data was presented using appropriate tables and summary statistics.

Experiment: This clinical experiment was done on 120 patients with elective surgical procedures in the period of January 2024 to December 2025 at Datta Meghe Medical College, Wanadongri, Nagpur. There were two groups; one receiving regional anaesthesia and the other receiving general anaesthesia, which comprised 60 patients in each group. Experimental observations were made from the pre- to post-op recovery. Patients undergoing a series of commonly performed elective procedures, such as general surgical and orthopedic procedures, were assessed based on clinical presentation and surgical intervention planned. Preoperatively, X-ray, ultrasound, computed tomography (CT) scan or magnetic resonance imaging (MRI) was reviewed to establish diagnosis of the underlying surgical problem if required. Instructions were given for evaluation of anxiety status and clinical status in the preoperative period prior to induction of anaesthetic. Thereafter, the planned procedure was performed under GA or RA and patients were carefully monitored perioperatively and assessed postoperatively. Therefore, clinical examination, diagnostic imaging, anaesthetic administration, operative observation and postoperative assessment were done in the experiment and it compared the overall perioperative experience between the two anaesthetic techniques.

The experiment has started off with the foundation of the surgical condition, prior to the application of anaesthesia. Size of the patient's imaging data, as available, was evaluated as well as the clinic's physical examination, depending on the type of surgery. For orthopedic cases, plain radiographs examined fractures, joint degeneration, alignment, and bone structural abnormalities and were done if detailed evaluation of bone, joint, ligament, or soft-tissue pathologies was clinically needed, though otherwise computed tomography (CT) or magnetic resonance imaging (MRI) was not considered for diagnosis. Ultronography or CT imaging was reviewed as appropriate, for other intra-abdominal pathology, gallbladder disease or abnormal abdominal wall defects in general surgical cases. They were conducted to give data that was objective and coincided with the clinical examination made prior to anaesthesia. The imaging studies were compared with the patient's clinical examination and routine preoperative assessment prior to the operation to be performed

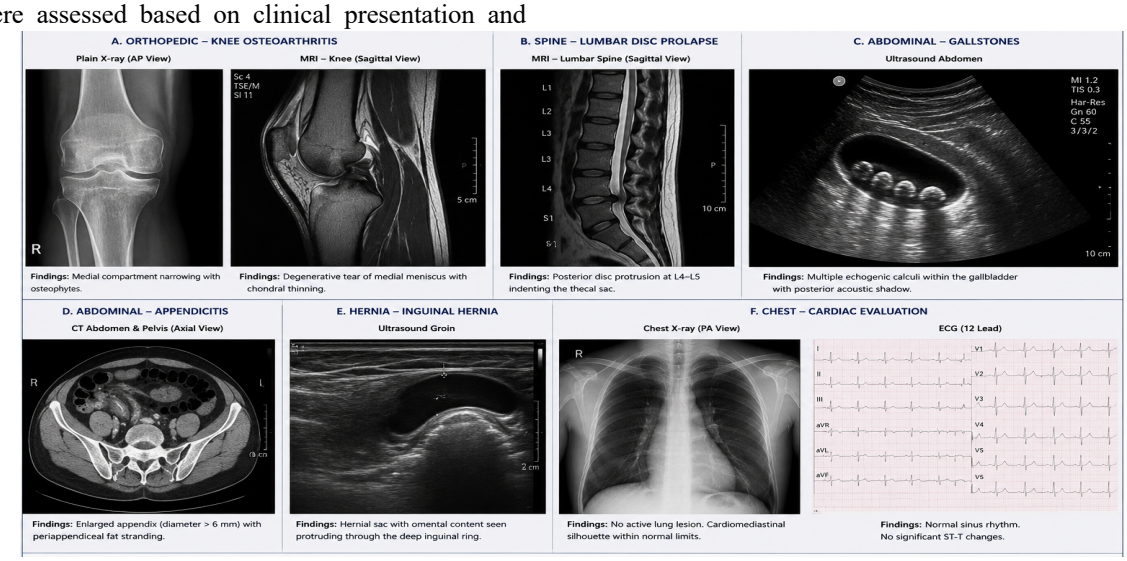

Figure 1: Representative preoperative diagnostic imaging used for assessment of patients undergoing elective surgical procedures

Psychological status of each patient was evaluated immediately prior to surgery after the clinical and diagnostic evaluation. The fear scale was completed prior to the anaesthetic as to assess the psychological response to the surgery and anaesthetic procedure. Each patient was assessed separately and the patient's anxiety score documented to provide a comparison. The mean score of preoperative anxiety for the GA and the RA group was 18.4 ± 4.2 and 15.7 ± 3.8 respectively. In 36.7% of patient with GA and 20.0% with RA moderate to severe anxiety was noted. Anxiety measurement was the primary pre-operative outcome measure, and was compared to outcome after surgery, including pain, recovery, analgesic use, and patient satisfaction.

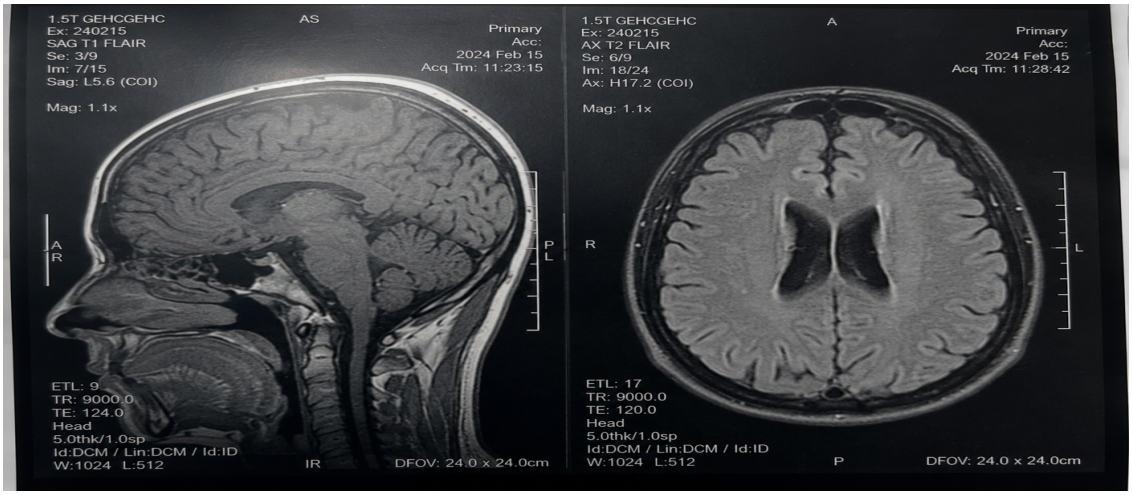

Figure 2: Representative preoperative clinical assessment and anxiety evaluation before administration of anaesthesia.

Once the pre-operative evaluation was completed, patients then went to the operation room for elective procedures. The patient who received general anaesthetic (GA) had the surgical procedure under general anaesthetic while a patient who received the planned regional anaesthetic (RA) had the surgical procedure under the planned regional anaesthetic technique. Surgical and non-surgical procedures, such as orthopedic and general surgery that either form of anaesthetic may be appropriate, were common. The patient was under continuous monitoring with standard peri-operative procedures, and peri-operative observations were made of the patient during the procedure. The period of operation comprised administration of the technique of anaesthesia elected, the surgical treatment, monitoring of the patient's physiological status and completion of the procedure. The anaesthetic technique used had not been experimentally changed and treatment was carried out as clinically decided by the anaesthetic team, unavailable observations were recorded in the prospective observation of patients during the study.

Figure 3: Representative intraoperative setting demonstrating administration of general or regional anaesthesia during elective surgery.

Patients underwent the post-operative observation period after surgery. Pain assessment was performed according to the predefined pain assessment method at 6 hours after surgery. Patients who received GA scored 4.1 ± 1.3 with a mean value for pain, while those who received RA had a mean value for pain of 2.8 ± 1.1. Rescue Analgesia was also noted and 61.7% of GA patients had needed another dose of Analgesia while 35.0% of RA patients had. The patients were also monitored for postoperative nausea and vomiting, recovery parameters and anaesthesia complications. PONV was seen in 25.0% of GA group and 10.0% of RA group. Adopting GA recovery time was 42.6 ± 10.8 min and undergoing RA recovery time was 31.4 ± 8.7 min.

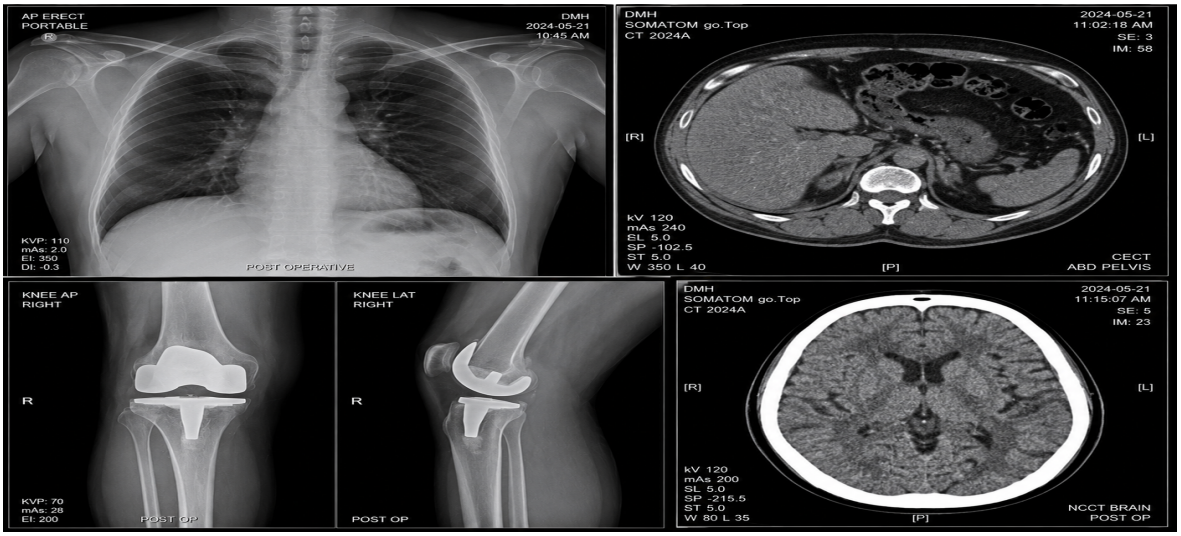

Figure 4: Representative postoperative clinical assessment demonstrating recovery and monitoring following elective surgery

The last experimental phase was follow-up of patients after surgery until discharge, and evaluation of final results of the surgery as a whole. The duration of hospital stay was calculated from the patient's admission date to the date of hospital discharge after hospital surgical treatment. The patient's satisfaction after recovery was used to measure the overall anaesthetic and surgical experience as a patient-reported outcome measure. Perioperative anaesthesia related complications were also recorded. The length of hospital stay was 3.8 ± 1.2 days in GA group and 3.4 ± 1.0 days in RA group, and the extent of patient satisfaction was at 73.3% and 88.3%, respectively. The proportion of patients with anaesthesia-related complications was 11.7% for GA patients, and 6.7% for RA patients. The entire spectrum of observations (pre-operative assessment, evaluation of anxiety, anaesthetic management, surgery, recovery and discharge) for the two groups was then compared, and differences in anxiety scores before surgery and perioperative outcomes were identified.

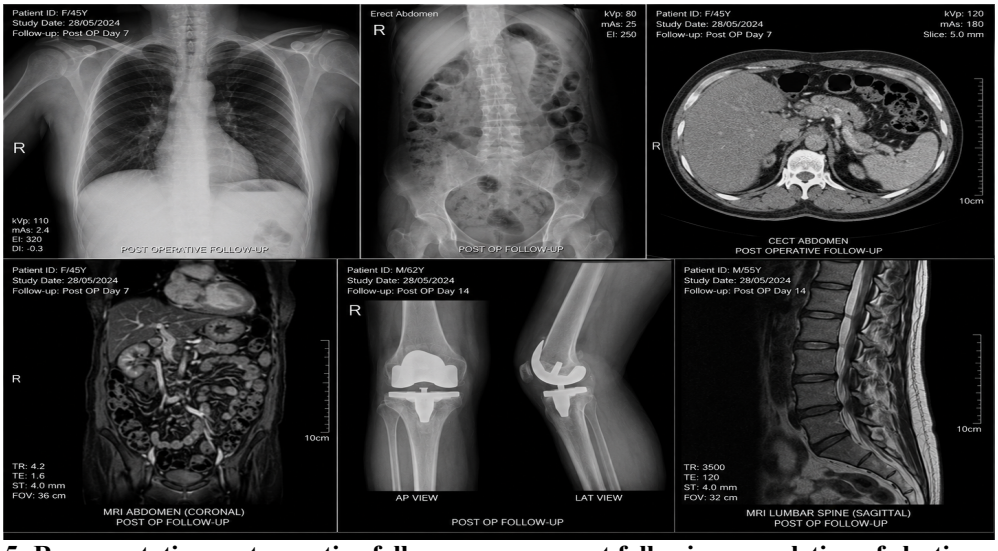

Figure 5: Representative postoperative follow-up assessment following completion of elective surgery.

Results

The study comprised 120 patients – 60 GA, and 60 RA. The variance of the data was expressed in square values of SD. For continuous data, the data were presented as mean values ± SD. The significant difference was found between two groups with respect to pre and post-surgical anxiety and pain duration as well as recovery period. The RA group experienced less pain, less anxiety and more satisfaction with the outcome of the surgery in the postoperative period than the GA group, whereas the postoperative recovery time, pain and anxiety of the RA group were lower, and satisfaction with the outcome of surgery was higher.

The GA group had a significantly higher mean score of preoperative anxiety level as compared to the RA group (18.4 ± 4.2 vs. 15.7 ± 3.8; P < 0.001). The variance of the GA group was 17.64 and that of the RA group was 14.44. There was moderate to severe level of anxiety in 36.7% of GA patients and 20.0% of RA patients and P = 0.048. Mean and variance on the GA group were also larger in these patients before surgery, highlighting that there was a higher burden of anxiety in this group preoperatively.

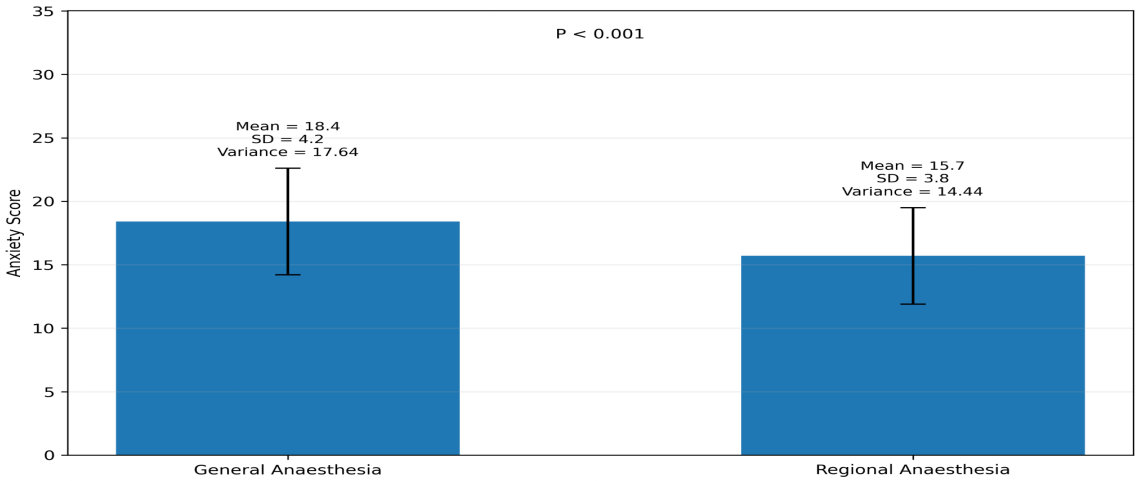

Figure 6: Comparison of preoperative anxiety scores between GA and RA groups.

The mean score of the perception score in the GA group was significantly higher at 6 hours after the surgery than in the RA group (4.1 ± 1.3 vs 2.8 ± 1.1, P < 0.001). The variance confirmed for GA and RA were 1.69 vs 1.21 respectively. The postoperative pain observations also had a wider range and the GA group's mean pain score higher. Number of patients who needed rescue analytics (GA: 61.7%) was significantly higher than that who did not (RA: 35.0%) (P = 0.004).

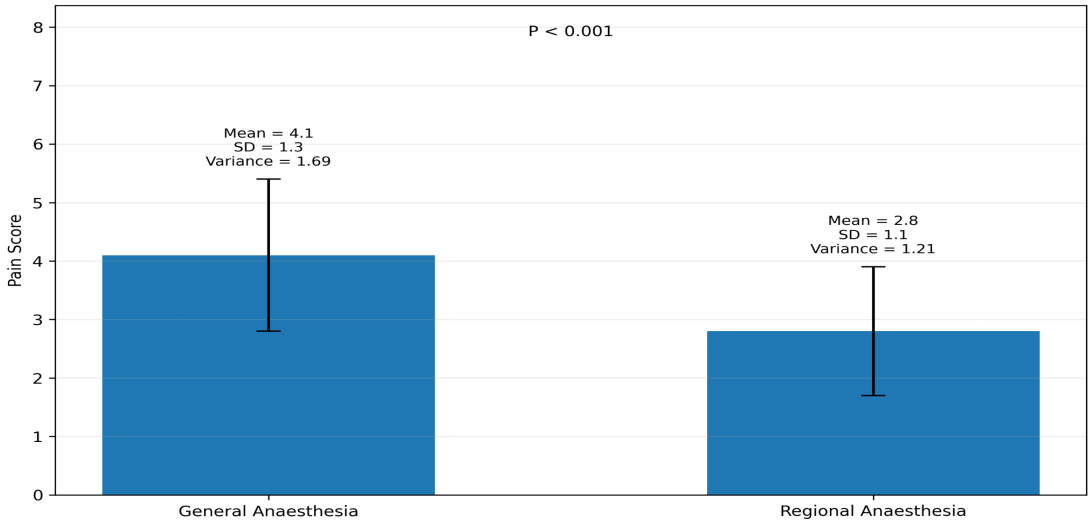

Figure 7: Comparison of postoperative pain scores at 6 hours between GA and RA groups.

Recovery time was significantly longer in the GA group than in the RA group (42.6 ± 10.8 vs. 31.4 ± 8.7 minutes; P < 0.001). Variance in GA group was 116.64 minutes² and variance in RA group was 75.69 minutes². There is a large range of SD within the GA group, indicating the large variability of recovery periods. PONV (P<0.032) was more common in GA patients (25.0%) than in RA patients (10.0%).

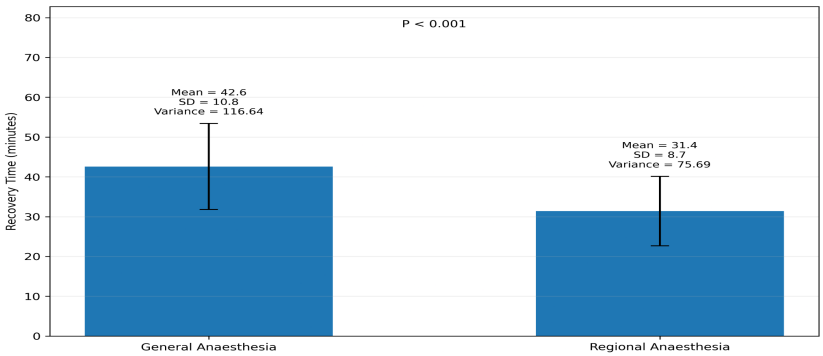

Figure 8: Comparison of postoperative recovery time between GA and RA groups.

The mean hospital stay was 3.8 ± 1.2 that of GA group and 3.4 ± 1.0 that of RA group. The variances for the corresponding were 1.44 and 1.00 days², respectively. The mean time for RA group was slightly less, though that was not statistically significant (P = 0.061). Standard deviation and variance of the RA data was relatively lower as compared to the other group, showing relatively limited spread of hospital stay variance.

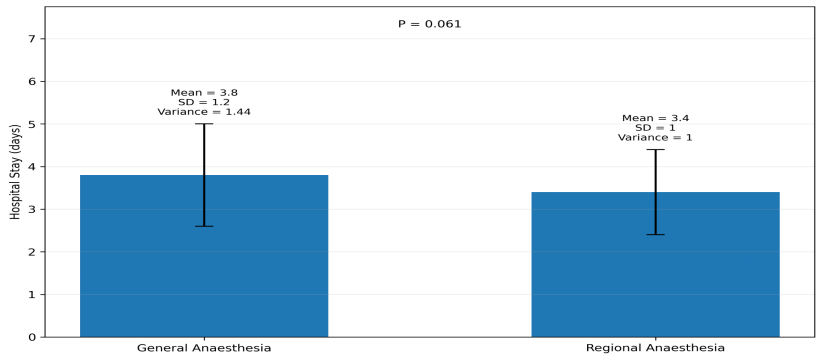

Figure 9: Comparison of duration of hospital stay between GA and RA groups.

The differences between the two anaesthetic groups in regards to the categorical outcomes were found. Thirty-six.7% of GA patients and 20.0% of RA had moderate to severe anxiety and 61.7% and 35.0% needed some form of relief analgesia, respectively. High rates of PONV were seen with GA as opposed to RA (25.0% vs 10.0%). Higher values of patient satisfaction were found in the RA group (88.3%) than in the GA group (73.3%) (P = 0.034). In GA patients, complications related to anaesthesia occurred in 11.7% while 6.7% in RA patients. The following are proportions - therefore they should be given as a percentage rather than as mean ± SD or variations.

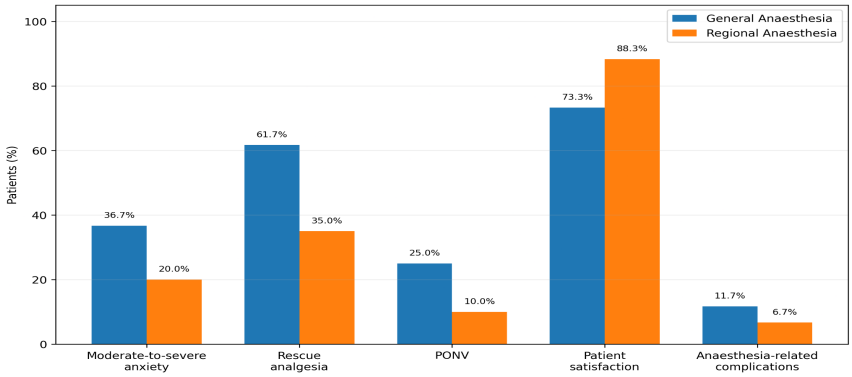

Figure 10: Comparative distribution of categorical perioperative outcomes between GA and RA groups.

Discussion

In the present study, it has been demonstrated that there was a significant difference in the anxiety score of patients undergoing the GA group and the RA group; higher score was noted in GA group. This is similar to previous studies that found that the expectation of being unconscious, intrusion of the air tube into the airway, discomfort following surgery, and not knowing what to expect when coming out of wither sedation or general anaesthesia resulted in negative psychological impacts prior to GA [11–13]. The stress associated with being anxious prior to the surgery could stimulate the sympathetic system and may diminish postoperative

pain perception, enhance the need for analgesics, and affect patient satisfaction [14,15]. The present study showed lower postoperative pain after RA than after GA, as well as with less need for rescue analgesia in patients receiving RA. It might be associated with prolonged analgesic action of regional nerve blockade, observed to be effective in inhibiting the transmission of nociceptive afferents in the initial postoperative period [16,17]. The substantial decrease in postoperative vomiting and nausea experienced by the RA group is also similar to other studies that found that although there was a significant decrease in exposure to systemic anaesthetic drugs and opioids, it also saw a decrease in vomiting and nausea during the postoperative period [18,19].

Patients on RA showed significantly faster recovery times, which corresponds with other literature reporting that general anaesthetic emergence of longer duration is associated with greater postoperative recovery time [20]. Hospital stay was marginally shorter in the RA group, but this did not reach statistical significance; it is likely that other factors relating to the surgeon or the patient have influenced the discharge. Discharge was likely to be influenced by many factors beyond anaesthetic technique such as the hospital stay, which was marginally shorter in the RA group, although this did not statistically significantly differ. RA patients achieved significantly higher patient satisfaction which could imply less pain, less nausea and quicker healing after surgery. When appropriately chosen, however, there was no significant difference between the groups for anaesthetic-related complications, suggesting that both techniques are safe to be used [21-22]. As a whole, the results are encouraging for individual anaesthetic planning taking both psychological and perioperative outcomes.

Conclusion

A total of 120 patients undergoing general anaesthesia (GA) and regional anaesthesia (RA) for elective surgery were assessed for pre anaesthetic anxiety and post anaesthetic outcomes at Datta Meghe Medical College, Wanadongri in the study period from January 2024 till December 2024. Their results show that the patients who were anaesthetised with GA had higher levels of preoperative anxiety than those who had received RA, but lower levels than individuals who had received other types of anaesthetic – this may suggest that there is an important relationship between anaesthetic technique and psychological response to surgery. Another finding was that the regional anaesthesia method significantly decreased the level of postoperative pain, rescue analgesic administration requirement, postoperative nausea, vomiting (PONV) rate and recovery time. These results suggest that with the added benefit of RA during the early postoperative period (i.e., anaesthetic and recovery period), these benefits can outweigh the use of the procedure only during the intra-operative period. The high satisfaction rate of patients with regional anaesthesia further confirmed the good post-operative experience when compared with the other groups. The mean hospital stay increases was noted to be greater in the regional anaesthetic group, but was not statistically significant, suggesting that factors other than type of anaesthetic may influence hospital stay. Similarly, although fewer anaesthesia related complications occurred with regional anaesthetic there was no statistically significant difference. Overall, the data indicate that population anaesthetised in a region had a better psychological and peri-operative profile. The choice of anaesthetic techniques should, however, be considered individually and should take into account the nature of the surgery, patient characteristics, indication, anaesthesiologist's own assessment and patient preference. Future research incorporating greater numbers of patients and consistent surgical populations is suggested to confirm the association of anaesthetic technique, preoperative anxiety and postoperative recovery.

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