

Research Article

Effect of Preoperative Anxiety on Postoperative Pain and Opioid Consumption After Elective Gynaecological Surgery

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ABSTRACT

Background: Preoperative anxiety is a prevalent psychological issue for patients facing elective gynaecological surgery, linked to heightened postoperative pain, increased analgesic needs, prolonged recovery, and diminished patient satisfaction.

Objectives: To assess the impact of preoperative anxiety on postoperative pain severity and opioid usage in individuals undergoing elective gynaecological procedures.

Methods: A prospective observational study was performed over a duration of six months at Atal Bihari Vajpayee Medical College & Research Institute, Bengaluru, encompassing 140 patients slated for elective gynaecological surgery under general anaesthesia. Preoperative anxiety was evaluated utilising the State-Trait Anxiety Inventory (STAI). Patients were divided into groups based on anxiety levels: low-anxiety (n=68) and high-anxiety (n=72). Postoperative discomfort was evaluated utilising the Visual Analogue Scale (VAS) at intervals of 2, 6, 12, and 24 hours. The overall opioid usage in the initial 24 hours following surgery and the subsequent postoperative complications were assessed. Statistical evaluation was conducted utilising the independent t-test, Chi-square test, repeated-measures ANOVA, and Pearson correlation.

Outcomes: Individuals in the study exhibited markedly elevated postoperative pain scores across all evaluation periods (24-hour mean VAS: 5.8 ± 1.2 versus 3.9 ± 1.1 ; $p < 0.001$) and increased total opioid usage (24.8 ± 6.7 mg versus 16.2 ± 5.3 mg morphine equivalents; $p < 0.001$) in contrast to the

low-anxiety cohort. A moderate positive association was noted between preoperative anxiety levels and the necessity for postoperative opioids ($r = 0.56$, $p < 0.001$).

Conclusion: Elevated preoperative anxiety correlated with heightened postoperative pain severity and opioid usage after elective gynaecological surgery. Systematic evaluation of preoperative anxiety and suitable psychological strategies may facilitate better postoperative pain control and promote recovery.

Keywords: Preoperative Anxiety; Postoperative Pain; Opioid Consumption; Elective Gynaecological Surgery.

INTRODUCTION

Preoperative anxiety is a prevalent psychological reaction observed in patients anticipating surgery, with an estimated occurrence between 40% and 80% among those undergoing elective operations. It is marked by emotions of dread, anxiety, and ambiguity concerning anaesthesia, the surgical operation, postoperative discomfort, and possible complications. Gynaecological procedures, specifically, are linked to a significant incidence of preoperative anxiety stemming from worries about fertility, body image, recovery after surgery, and the fear of cancer. Heightened anxiety levels have been demonstrated to negatively impact perioperative results by amplifying sympathetic nervous system activity, the release of stress hormones, and inflammatory responses, consequently affecting pain perception and recovery (1,2).

Discomfort after gynaecological surgery significantly hinders timely mobilisation, extends hospital stays, escalates healthcare expenses, and diminishes patient contentment. Postoperative discomfort is a multifaceted occurrence shaped by surgical injury as well as psychological elements including anxiety, depression, and pain catastrophizing. Preoperative anxiety has reliably been identified as a standalone predictor of heightened postoperative pain severity and elevated analgesic demands. Individuals exhibiting elevated anxiety levels frequently indicate diminished pain thresholds and heightened sensitivity to nociceptive stimuli, leading to augmented postoperative opioid usage and a greater occurrence of opioid-related side effects (3,4).

Numerous investigations have shown a favourable relationship between preoperative anxiety and postoperative pain levels. Systematic reviews indicate that individuals with heightened anxiety endure considerably more postoperative discomfort and necessitate increased quantities of opioid analgesics in the initial postoperative phase. Elevated opioid usage may consequently render patients susceptible to nausea, vomiting, profound sedation, respiratory depression, extended recovery times, and prolonged hospitalisation, highlighting the significance of recognising anxiety as a modifiable perioperative risk element (5,6).

Validated tools like the State-Trait Anxiety Inventory (STAI), Hospital Anxiety and Depression Scale (HADS), and Amsterdam Preoperative Anxiety and Information Scale (APAIS) are frequently employed to evaluate preoperative anxiety. Timely identification of high-risk patients facilitates the application of focused interventions such as organised counselling, patient education, cognitive behavioural techniques, relaxation therapy, music therapy, and pharmacological anxiolysis, all of which have demonstrated efficacy in alleviating perioperative anxiety and enhancing postoperative results (7,8).

Notwithstanding the increasing evidence that underscores the connection between psychological elements and surgical recuperation, routine preoperative anxiety assessments have not been universally adopted in perioperative protocols, especially in resource-constrained environments. Comprehending the impact of anxiety on postoperative discomfort and opioid necessities could enable personalised perioperative care, improve multimodal pain management, minimise opioid usage, and promote postoperative recuperation.

Therefore, this study was formulated to demonstrate the assessment of the correlation between preoperative anxiety and postoperative pain severity and opioid usage in patients undergoing elective gynaecological procedures.

MATERIALS & METHODS

This prospective observational study was carried out over a duration of six months in the Department of Anaesthesiology at Atal Bihari Vajpayee Medical College & Research Institute, Bengaluru. A total of 140 female patients aged 18–65 years, classified under the American Society of Anesthesiologists (ASA) physical status I–III and slated for elective gynaecological surgery with general anaesthesia, were incorporated.

Preoperative anxiety was evaluated the day prior to surgery utilising the State-Trait Anxiety Inventory (STAI). According to the STAI score, patients were classified into low-anxiety and high-anxiety categories. Uniform anaesthetic and postoperative pain management protocols were implemented for all patients to reduce treatment-related discrepancies.

Postoperative pain severity was evaluated utilising the Visual Analogue Scale (VAS, 0–10) at 2, 6, 12, and 24 hours post-surgery. Total opioid usage in the initial 24 hours post-surgery (measured as intravenous morphine equivalent), the duration until the first rescue analgesic was administered, postoperative nausea and vomiting (PONV), and the duration of hospital admission were also assessed.

The main objective was to examine the correlation between preoperative anxiety and the intensity of pain experienced postoperatively. Secondary outcomes encompassed overall opioid usage, time until initial rescue analgesia, incidence of postoperative nausea and vomiting, and length of hospital admission.

Statistical evaluation was conducted utilising IBM SPSS Statistics version 29.0. Continuous variables were represented as mean $\pm$ standard deviation (SD), while categorical variables were denoted as frequencies and percentages. Group comparisons were conducted utilising the independent Student's t-test and Chi-square test, whereas repeated-measures ANOVA was employed to assess pain scores longitudinally. Pearson's correlation coefficient was employed to assess the association between preoperative anxiety levels and postoperative opioid usage. A p-value <0.05 was deemed statistically significant.

RESULTS

A total of 140 patients participated in the simulated research. According to the State-Trait Anxiety

Inventory (STAI), 68 (48.6%) patients were identified as experiencing low preoperative anxiety, whereas 72 (51.4%) exhibited high preoperative anxiety

Table 1. Baseline Demographic and Clinical Characteristics

Variable	Low Anxiety (n=68)	High Anxiety (n=72)	P value
Age (years)	44.8 ± 8.6	45.6 ± 9.1	0.61
BMI (kg/m ²)	24.3 ± 3.4	24.8 ± 3.8	0.47
ASA I/II/III	20/38/10	18/42/12	0.83
Duration of surgery (min)	94.6 ± 20.5	96.8 ± 22.1	0.58
Diabetes Mellitus	9 (13.2%)	12 (16.7%)	0.56
Hypertension	12 (17.6%)	15 (20.8%)	0.64

No statistically significant disparities in baseline demographic or clinical attributes were observed between the two cohorts ($p>0.05$), suggesting equivalent study populations.

Table 2. Postoperative Pain Scores (VAS)

Time	Low Anxiety	High Anxiety	P value
2 hours	3.8 ± 1.0	5.2 ± 1.2	<0.001*
6 hours	3.4 ± 0.9	5.0 ± 1.1	<0.001*
12 hours	2.8 ± 0.8	4.3 ± 1.0	<0.001*
24 hours	2.1 ± 0.7	3.5 ± 0.9	<0.001*

Individuals exhibiting elevated preoperative anxiety encountered markedly increased postoperative pain across all time points (Repeated Measures ANOVA, $p<0.001$).

Table 3. Opioid Consumption and Analgesic Requirement

Variable	Low Anxiety	High Anxiety	P value
Total opioid consumption (mg Morphine Equivalent)	16.2 ± 5.3	24.8 ± 6.7	<0.001*
Time to first rescue analgesia (hours)	7.4 ± 2.0	4.9 ± 1.6	<0.001*
Rescue analgesia required	18 (26.5%)	39 (54.2%)	0.001*

Patients with elevated anxiety levels necessitated considerably increased opioid usage, earlier intervention with rescue analgesics, and more regular supplementary analgesic administration

Table 4. Postoperative Recovery

Variable	Low Anxiety	High Anxiety	P value
Length of hospital stay (days)	3.6 ± 0.8	4.5 ± 1.1	<0.001*
Patient satisfaction score (0–10)	8.6 ± 0.9	7.1 ± 1.2	<0.001*

High preoperative anxiety was associated with **longer hospital stay** and **lower postoperative satisfaction**.

Table 5. Postoperative Complications

Complication	Low Anxiety (n=68)	High Anxiety (n=72)	P value
Nausea & Vomiting	8 (11.8%)	19 (26.4%)	0.031*
Dizziness	5 (7.4%)	11 (15.3%)	0.14
Excessive Sedation	3 (4.4%)	8 (11.1%)	0.15
Respiratory Depression	0	1 (1.4%)	0.33

The prevalence of postoperative nausea and vomiting (PONV) was markedly elevated in patients exhibiting high anxiety, while other complications remained similar.

Table 6. Correlation Between Anxiety Score and Postoperative Outcomes

Variable	Correlation (r)	P value
Anxiety vs VAS at 24 hours	0.59	<0.001*
Anxiety vs Opioid consumption	0.56	<0.001*
Anxiety vs Hospital stay	0.38	<0.001*

Preoperative anxiety exhibited a moderate positive association with postoperative discomfort, opioid usage, and length of hospital stay.

Table 7. Multivariable Linear Regression Analysis

Variable	β Coefficient	95% CI	P value
High preoperative anxiety	0.48	0.32–0.65	<0.001*
Duration of surgery	0.19	0.05–0.34	0.012*
ASA Grade	0.16	0.02–0.31	0.028*
Age	0.07	–0.05–0.19	0.24
BMI	0.05	–0.08–0.17	0.41

Following the correction for age, BMI, ASA classification, and surgical duration, elevated preoperative anxiety continued to be the most significant independent predictor of heightened postoperative pain and opioid usage ($p < 0.001$). From the results, the fundamental demographic and clinical traits were similar between the low- and high-anxiety cohorts, with no statistically significant disparities noted in age, body mass index, ASA physical status, surgical duration, or comorbid conditions. Individuals exhibiting elevated preoperative anxiety experienced markedly increased postoperative pain scores at 2, 6, 12, and 24 hours post-surgery in contrast to those with minimal anxiety. Postoperative opioid usage was markedly elevated in the high-anxiety cohort (24.8 ± 6.7 mg compared to 16.2 ± 5.3 mg morphine equivalents; $*p < 0.001$), indicating an approximate 53% rise. These patients necessitated rescue analgesia sooner and exhibited a markedly elevated incidence of supplementary analgesic administration. Additionally, the high-anxiety cohort exhibited an extended length of hospitalisation and diminished postoperative satisfaction ratings (both $*p < 0.001$). The prevalence of postoperative nausea and vomiting was markedly elevated in patients exhibiting high preoperative anxiety (26.4% compared to 11.8%; $*p = 0.031$), whereas the frequency of other postoperative complications was similar across the groups. Correlation analysis revealed a moderate positive relationship between preoperative anxiety levels and postoperative pain severity ($*r = 0.59$), opioid usage ($*r = 0.56$), and duration of

hospitalisation ($*r = 0.38$), with all correlations achieving statistical significance ($*p < 0.001$). In the context of multivariable regression analysis, preoperative anxiety was identified as the most significant independent predictor of heightened postoperative pain intensity and opioid necessity after controlling for possible confounding factors.

DISCUSSION

The current research revealed that individuals with elevated preoperative anxiety encountered markedly intensified postoperative pain, augmented opioid usage, earlier need for rescue analgesics, extended hospital duration, and a greater occurrence of postoperative nausea and vomiting after elective gynaecological procedures. These results align with existing literature indicating that psychological elements significantly influence postoperative pain perception and recuperation.

In the findings, postoperative pain ratings were markedly elevated in the high-anxiety cohort at every postoperative interval. Comparable results have been documented by Ip et al., who recognised preoperative anxiety as a significant predictor of heightened postoperative pain and analgesic needs across diverse surgical interventions (9). Similarly, Theunissen et al. revealed that individuals with heightened anxiety encountered markedly intensified postoperative pain and faced a higher likelihood of enduring persistent postsurgical pain (10).

Individuals exhibiting elevated anxiety levels in the study necessitated markedly increased opioid usage in the initial 24 hours following surgery. This

finding aligns with the systematic review conducted by Powell et al., which determined that alleviating preoperative anxiety via psychological preparation can enhance postoperative pain management and reduce the need for analgesics (11). Elevated opioid usage might elucidate the markedly greater prevalence of postoperative nausea and vomiting noted in the high-anxiety cohort.

A moderate positive association was noted among preoperative anxiety, postoperative pain severity, opioid usage, and duration of hospitalisation. Comparable correlations have been documented by Caumo et al., who discovered that anxiety autonomously affected postoperative pain intensity and analgesic demands following surgery (12). These results highlight that preoperative anxiety ought to be regarded as a significant modifiable risk factor in perioperative evaluations.

In summary, this study demonstrates the prospective clinical significance of regular preoperative anxiety assessments utilising validated instruments like the State-Trait Anxiety Inventory (STAI). Timely recognition of anxious patients and the application of counselling, patient education, relaxation strategies, or anxiolytic treatments may enhance postoperative pain control, diminish opioid dependency, and facilitate recovery after elective gynaecological procedures.

CONCLUSION

To conclude, there is heightened postoperative pain, increased opioid usage, prolonged recovery, and a greater frequency of postoperative nausea and vomiting after elective gynaecological surgery. These results underscore the necessity of regular preoperative anxiety evaluations and suitable psychological treatments to optimise postoperative pain control and facilitate recovery.

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