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A PROSPECTIVE STUDY ON THE EFFECTS OF PSYCHOTROPIC DRUG USE ON POSTOPERATIVE RECOVERY IN MEDICALLY ILL PATIENTS UNDERGOING ELECTIVE SURGERY

Dr. Caroline Peter D'Souza[1*], Dr. Manjula Shetty[2], Dr. Sandesh K.S.[3], Dr. Leeladhar D.V.[4], Dr. Shyam Krishna Ashok[5]

[1*]Assistant Professor, Kasturba Medical College, Mangalore
[2]Assistant Professor, KVG Medical College and Hospital, Sullia
[3]Assistant Professor, Department of Postgraduate Studies, Nehru Memorial College, Sullia
[4]Associate Professor of Ayurveda, KVG Medical College, Sullia
[5]Assistant Professor, KVG Medical College and Hospital, Sullia

Abstract
This prospective observational study investigated the impact of psychotropic drug use on postoperative recovery among medically ill adults undergoing elective surgery. The research addressed the limited evidence describing how chronic psychotropic medication affects recovery trajectories, including pain, sedation, delirium, and length of hospital stay. The primary objectives were to compare postoperative outcomes between patients with and without preoperative psychotropic drug exposure and to identify associated risks that could inform perioperative care strategies. The study enrolled 200 patients, with 100 psychotropic users and 100 non-users. Data were collected on baseline characteristics, perioperative variables, and standardized measures of pain, sedation, delirium, and complications. Analysis revealed that psychotropic users experienced significantly higher early postoperative pain scores, greater sedation within the first 12 hours, a higher incidence of delirium (21% vs. 9%), and longer hospital stays. These findings are significant because they highlight the need for heightened perioperative vigilance, individualized analgesia plans, and multidisciplinary collaboration to mitigate risks associated with psychotropic medication. The results underscore the broader impact of psychiatric pharmacotherapy on surgical recovery, with implications for patient education, resource utilization, and safety protocols. Future research should explore targeted interventions, stratified risk assessments, and the long-term effects of psychotropic drug use on functional outcomes.

Keywords: Psychotropic drugs, Postoperative recovery, Elective surgery, Delirium, Sedation, Pain management

1. Introduction

Postoperative recovery is a multifactorial phenomenon that can be discussed as a combination of physiological, pharmacological, and psychological effects that define the surgical outcomes, patient satisfaction, and the occurrence of complications. The prevalence of psychiatric comorbidities and the prescription rate of psychotropic drugs are both increasing globally, making perioperative psychotropic medication a topical issue (Guenther & Radtke, 2011; Jellish & O'Rourke, 2012; Vázquez Moyano & Uña Orejón, 2011). It has become evident that preoperative and long-term use of

medications, such as antidepressants, benzodiazepines, and antipsychotics, can significantly change perioperative physiology and patient-related outcomes, although anesthesiologists and surgeons have historically focused on surgical procedures and anesthetic selection (Weaver, 2011; Wong et al., 2014). Simultaneously, contemporary surgical care is also becoming more focused on enhanced recovery pathways, patient safety, and limiting opioid administration, which once again highlights the criticality of the knowledge regarding the potential interactions of psychotropic drugs with anesthetic regimens and postoperative courses (Arsalani-Zadeh et al., 2011; Jia et al., 2019; Wick et al., 2017). Psychotropic medications may have various effects along the perioperative continuum, affecting the level of sedation, perioperative pain, emergence, risk of delirium, and even intraoperative hemodynamics (Banchs & Lerman, 2014; Guenther & Radtke, 2011; Jellish & O'Rourke, 2012).

As an illustration, benzodiazepines, such as midazolam, are the most popular premedication drugs, which are linked to increased risks of postoperative delirium, especially in older people (Banchs & Lerman, 2014; Guenther & Radtke, 2011). Serotonin-norepinephrine reuptake inhibitors and selective serotonin reuptake inhibitors are antidepressants that may cause alterations in the risk of intraoperative bleeding, varied opioid needs, and altered nociceptive processing (Gilron, 2016; Wong et al., 2014). Similarly, the use of perioperative adjunctive esketamine has also been studied to treat depression and reduce opioid usage, although research on its cognitive and neuropsychiatric side effects is still ongoing (Wong et al., 2014; Gilron, 2016).

Although the body of research in this area is growing, a large portion of the evidence base has been derived from trials of a single psychotropic medication, particularly specific surgical circumstances, or pediatric populations (Welberg et al., 2006; Wong et al., 2014; Weaver, 2011). Therefore, there is a lack of general evidence about how long-term usage of psychotropic drugs affects recovery outcomes in terms of pain, sedation, delirium, infection, and duration of hospital stay in medically sick adult patients undergoing elective surgery. With more elective operations performed globally and the burden of mental health comorbidities growing, the gap presents an immediate danger to the quality of perioperative treatment (Vázquez Moyano & Uña Orejón, 2011; Jellish & O'Rourke, 2012; Wick et al., 2017).

The issue that contextualizes this research, thus, is the insufficient prospective evidence characterizing the overall effect of psychotropic drugs on postoperative recovery of medically complex adult patients. Few studies have systematically examined the relationship between long-term psychotropic regimens and overall outcomes, even though numerous randomized trials have assessed specific interventions, such as the anxiolytic qualities of gabapentinoids (Borde et al., 2017; Rai et al., 2017), the effects of esketamine on depression and delirium (Gilron, 2016; Wong et al., 2014), or melatonin against midazolam premedication (Banchs & Lerman, 2014). Uncertainties in perioperative planning, challenges with risk assessment, and variations in care standards are caused by this ambiguity (Guenther & Radtke, 2011; Jellish & O'Rourke, 2012; Liu & Wu, 2007).

The study presents some new developments in the perioperative and psychiatric literature. As opposed to the limited nature of previous research, which targeted pediatric patients (Welberg et al., 2006), a particular type of surgery, such as the gynecologic (Castro-Alves et al., 2016) or the thoracic one (Kapoor, 2011), or the effect of a specific drug, such as esketamine (Gilron, 2016), this study uses a prospective design on medically complex adult patients with elective surgery. It addresses a significant gap in knowledge because it is one of the first studies to compare a wide range of psychotropic medications and assess parallel outcomes of various recovery methods (Wick et al., 2017; Rai et al., 2017).

This work may be important because it could be used to develop clinical guidelines, preoperative counseling, and patient-centered care. With the population of elderly and medically frail patients undergoing elective surgery steadily increasing, the problem that perioperative teams have to face is an effective analgesia and anxiolysis with minimal risks of over-sedation, long-term cognitive impairment, and slow recovery (Guenther & Radtke, 2011; Banchs & Lerman, 2014). The study can offer useful data to help strike the right balance between the advantages and disadvantages of further psychotropic use in favor of a personalized approach to the development of a perioperative plan,

monitoring, and education (Jellish & O'Rourke, 2012). By doing that, it contributes to the mission of safer, more individualized surgical care with an understanding of the overlap between mental health and perioperative medicine (Wick et al., 2017).

This study was designed with two main objectives. The first is to examine the relationship between preoperative psychotropic drug use and postoperative outcomes, including pain scores, sedation levels, delirium incidence, wound infections, readmission rates, and length of hospital stay in medically ill patients undergoing elective surgery. The second aim is to compare these recovery outcomes with those of patients not exposed to psychotropic medications, thereby clarifying potential risks and guiding perioperative management strategies.

2. Methodology

2.1 Study Design

In this study, a prospective observational study was used where data could be collected and followed up in a systematic manner during a pre-determined period after the surgery. This research was conducted to establish the relationship between preoperative psychotropic drug utilization and the different postoperative recovery measures in medically ill adult patients who underwent elective surgery.

2.2 Study Setting and Duration

The department of general surgery, with other surgical units of a tertiary care teaching hospital, was used in conducting the study. Participants were recruited over 12 months (June 2018 to May 2019), and follow-ups were carried out in the postoperative period lasting up to 30 days post-surgery.

2.3 Participants

Adults (18 years of age or older), those with a documented diagnosis of at least one medical comorbidity (such as diabetes mellitus, hypertension, chronic obstructive pulmonary disease, or chronic kidney disease), and those undergoing elective surgery under general anesthesia were the inclusion criteria. As the exposed group, the patients who received psychotropic medications, such as antidepressants, antipsychotics, benzodiazepines, mood stabilizers, or sedative-hypnotics during at least four weeks before the surgery, were identified. The unexposed group came in the form of those who did not use psychotropic drugs.

Patients were excluded in case of an emergency surgery, cognitive impairment that made it impossible to give informed consent, or cases of palliative surgical care. All eligible patients provided written informed consent before enrollment.

2.4 Sample Size and Sampling Technique

It was predicted that a total of 200 patients would be used as a sample, with a projected number of about 100 in each group (psychotropic drug users and non-users). The consecutive sampling method was used to recruit eligible patients when presenting to receive preoperative assessment until the sample size was attained.

2.5 Data Collection Procedures

Baseline data were collected during the pre-anesthetic evaluation. A structured proforma was used to retrieve information that included demographic variables (age, sex), medical diagnoses, psychiatric diagnoses where present, and psychotropic medication (type, dose, and duration). Perioperative factors such as duration of anesthesia, intraoperative complications, and complexity of the surgery were also documented.

Postoperative recovery was assessed using multiple standardized measures. The Visual Analogue Scale was used to determine the level of pain 6, 12, 24, and 48 hours after surgery. The scale used to assess postoperative sedation was the Ramsay Sedation Scale. The Confusion Assessment Method

was used every day to screen for delirium. Patient records and follow-up interviews were used to record patient length of stay in the hospital after surgery, wound infection, and 30-day readmission.

2.6 Outcome Measures

The first outcome was postoperative hospital stay (days). Secondary outcomes consisted of postoperative pain rating, sedation, the occurrence of delirium, wound infection, and 30-day readmission. These were compared among patients who are using and not using psychotropic medications.

2.7 Ethical Considerations

The study was only initiated after receiving ethical approval from the Institutional Ethics Committee. The objectives, possible risks, and the right to withdraw at any point without affecting their care were explained to all the participants. Confidentiality of patient data was strictly maintained.

2.8 Data Analysis

After the data was put into a secure database, it was evaluated using IBM SPSS Statistics version 22. Frequencies and percentages were employed to describe categorical variables, whereas averages and standard deviations were used to describe continuous data. Continuous variables were compared using either the independent samples t-test or the Mann-Whitney U test, depending on whether the distribution was normal. Chi-square tests were employed for categorical comparisons. The p-value was less than 0.05; it was deemed significant.

3. Results

3.1 Baseline Characteristics

The study included 200 patients in total, 100 of whom were in the group of patients who used psychotropic drugs and 100 of whom did not. The mean age among psychotropic users was 58.4 ± 12.3 years, while among non-users it was 56.7 ± 11.9 years (p = 0.348). The proportion of male patients was similar between groups, with males constituting 54% of psychotropic users and 52% of non-users (p = 0.770). Comorbidities such as diabetes mellitus, hypertension, and chronic kidney disease were evenly distributed without significant differences between groups. Table 1 provides a summary of these variables.

Table 1: Clinical and Demographic Features

Variable	Psychotropic Users (n = 100)	Non-Users (n = 100)	p-value
Age, mean ± SD (years)	58.4 ± 12.3	56.7 ± 11.9	0.348
Male sex, n (%)	54 (54%)	52 (52%)	0.770
Diabetes mellitus, n (%)	45 (45%)	41 (41%)	0.585
Hypertension, n (%)	62 (62%)	60 (60%)	0.764
Chronic kidney disease, n (%)	12 (12%)	9 (9%)	0.490

3.2 Postoperative Pain Scores

Postoperative pain intensity was measured by means of the Visual Analogue Scale (VAS). As shown in Table 2, psychotropic drug users reported significantly higher pain scores at 6 hours (mean VAS 6.4 vs. 5.1, p <0.001) and 12 hours (mean VAS 5.9 vs. 4.8, p <0.001). The difference in pain scores diminished by 24 and 48 hours postoperatively.

Table 2. Postoperative Pain Scores (VAS Mean ± SD)

Time Point Post-Surgery	Psychotropic Users	Non-Users	p-value
6 hours	6.4 ± 1.2	5.1 ± 1.3	<0.001
12 hours	5.9 ± 1.1	4.8 ± 1.2	<0.001
24 hours	4.2 ± 1.0	3.9 ± 1.1	0.090
48 hours	2.8 ± 0.9	2.6 ± 0.8	0.240

The temporal trends in pain scores are also illustrated in Figure 1 below.

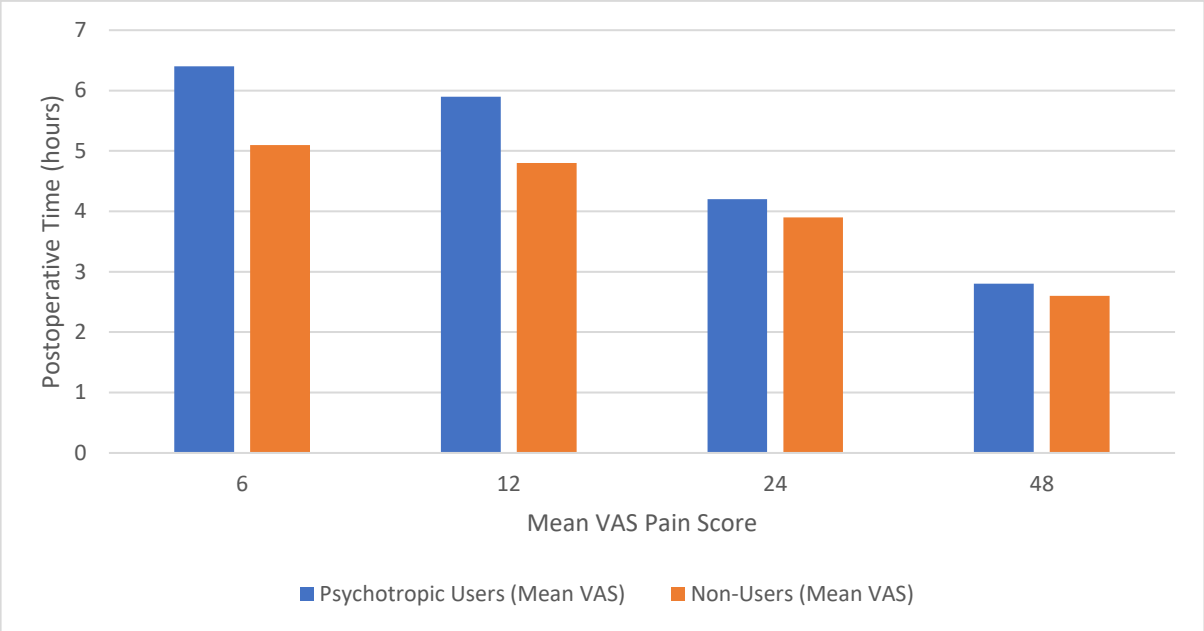

Figure 1. Mean Postoperative Pain Scores Over Time

3.3 Sedation Levels

Sedation was evaluated using the Ramsay Sedation Scale at corresponding postoperative intervals. As presented in Table 3, psychotropic users had significantly higher sedation scores at 6 hours and 12 hours. No significant differences were observed at 24 or 48 hours.

Table 3. Postoperative Sedation Scores (Mean ± SD)

Time Point Post-Surgery (hours)	Psychotropic Users	Non-Users	p-value
6	3.7 ± 0.8	2.9 ± 0.7	<0.001
12	3.4 ± 0.9	2.7 ± 0.6	<0.001
24	2.6 ± 0.7	2.4 ± 0.5	0.082
48	2.1 ± 0.5	2.0 ± 0.4	0.300

3.4 Incidence of Delirium

Postoperative delirium occurred significantly more frequently among psychotropic users. Specifically, delirium was observed in 21% of psychotropic users compared to 9% of non-users (p = 0.019), as detailed in Table 4.

3.5 Length of Postoperative Hospital Stay

The mean length of postoperative hospital stay was 7.9 ± 2.3 days in the psychotropic group and 6.4 ± 1.8 days in the non-user group, a difference that reached statistical significance (p <0.001). The distribution of length of stay is further summarized in Table 4.

3.6 Wound Infection and Readmission

Wound infections were reported in 13% of psychotropic users compared to 8% of non-users (p = 0.232). Readmission within 30 days was more frequent in psychotropic users (12%) than in non-users (6%), though the difference was not statistically significant (p = 0.134). These outcomes are collectively presented in Table 4.

Table 4. Postoperative Complications and Outcomes

Outcome	Psychotropic Users (n = 100)	Non-Users (n = 100)	p-value
Delirium, n (%)	21 (21%)	9 (9%)	0.019
Wound infection, n (%)	13 (13%)	8 (8%)	0.232
Readmission within 30 days	12 (12%)	6 (6%)	0.134
Length of stay, mean ± SD	7.9 ± 2.3 days	6.4 ± 1.8 days	<0.001

4. Discussion

Results of this prospective observational study show that psychotropic drug use in medically ill patients undergoing elective surgery is linked to several important differences in the postoperative period compared to patients not exposed to psychotropics. Notably, psychotropic users experienced higher early postoperative pain scores, sedation during the first 12 hours, increased incidence of delirium, and longer hospital stays. The clinical implications of these findings are tremendous for perioperative planning and patient safety.

It is possible to interpret the findings and arrive at the conclusion that the use of psychotropic medications before surgery may worsen the nociceptive processing and increase the perception of pain in the early postoperative period. The psychotropic group scored considerably higher in Visual Analogue Scale (VAS) pain at 6 hours and 12 hours following surgery, but the difference declined at 24 and 48 hours. Such a trend can be attributed to the neurochemical alterations that are associated with chronic psychotropic exposure, i.e., receptor desensitization and changes in central pain modulation. Also, these patients recorded increased Ramsay Sedation Scale scores at the initial stages of recovery, which means that they are more likely to accumulate sedatives and require more time to awaken (Banchs & Lerman, 2014; Jellish & O'Rourke, 2012).

Delirium risk was also quite high, with 21% of psychotropic users and 9% of non-users being affected. The adverse effect of benzodiazepines and other sedatives, delirium, is linked with an increase in the length of hospital stay and worse functional outcomes. Psychotropic users had a much longer average length of hospitalization, which most likely indicates more pain, oversedation, and delirium. Even though the rates of wound infection and 30-day readmission were higher in psychotropic users, the difference could not be considered statistically significant, which could be explained by the small sample size.

These findings are consistent with the trends compared to previous studies. As an example, the use of midazolam in older patients before surgery was associated with a higher chance of delirium and poor early recovery (Guenther & Radtke, 2011), which confirms the present study results of the higher prevalence of delirium among psychotropic users. Equally, Banchs and Lerman (2014) reported a relationship between perioperative psychotropic medication and the occurrence of poor cognitive outcomes in older persons, further clarifying the high risk of delirium in this study. In terms of the outcomes of pain, chronic antidepressant medication can change opioid sensitivity and increase postoperative pain scores (Gilron, 2016; Wong et al., 2014; Rai et al., 2017), which is in line with the high amount of early pain in this population.

Moreover, perioperative esketamine has been investigated as a depression and pain management therapy (Wong et al., 2014; Gilron, 2016). Although other researchers indicate that esketamine has the potential to decrease opioid requirements, its cognitive side effects are an issue (Castro-Alves et al., 2016; Wick et al., 2017). These safety risks are captured by the findings of the current study, which demonstrated more sedation and delirium, particularly among the elderly or medically complex patients (Guenther & Radtke, 2011; Vázquez Moyano & Uña Orejón, 2011). Since continuous

psychotropic regimens hinder surgical recovery due to their interactions with anesthetic drugs and delay the process of physiological stabilization, the longer hospital stay is also consistent with evidence showing that antidepressants and benzodiazepines can impair functional recovery (Weaver, 2011; Castro-Alves et al., 2016).

This research has great clinical implications. Since surgical care is gradually turning to enhanced recovery pathways to reduce the risk of complications (Arsalani-Zadeh et al., 2011; Jia et al., 2019), it is essential to know the perioperative risks of psychotropic drugs. This evidence suggests that patients on chronic psychotropic therapy should be monitored more closely for oversedation, delirium, and pain control (Guenther & Radtke, 2011). Perioperative teams should be prepared to adapt anesthetic plans, utilize multimodal analgesia, and consult psychiatry when needed (Buvanendran & Kroin, 2007; Kurd et al., 2017). Additionally, shared decision-making should include open discussions of potential risks related to prolonged recovery and cognitive disruption during preoperative counseling (Liu & Wu, 2007; Penprase et al., 2015).

However, this study has limitations that should be considered. Its observational design cannot establish causality, even though the associations are strong (Myles, 2016). Unmeasured confounders, such as baseline cognitive impairment or medication adherence, may influence outcomes (Welberg et al., 2006; Weaver, 2011). The heterogeneity of psychotropic medications (benzodiazepines, antidepressants, mood stabilizers, etc.) limits the ability to isolate effects by drug class. Some secondary outcomes, such as wound infection and readmission, could have been underpowered, even if the number of participants was adequate to identify differences in the primary outcomes (Theurer, 2016). Lastly, data were collected from only one tertiary care facility, which may limit generalizability to other surgical settings or patient populations (Kurd et al., 2017).

Future research should involve randomized controlled trials or large prospective cohorts stratified by psychotropic medication type and dose (Penprase et al., 2015). Exploring whether risks can be mitigated without worsening psychiatric conditions, such as reducing doses perioperatively or temporarily discontinuing certain medications, would be valuable (Rai et al., 2017; Gilron, 2016). Incorporating biomarkers of neuroinflammation or pharmacogenomic profiling could enhance understanding of how psychotropics influence pain perception and cognitive recovery (Borde et al., 2017; Castro-Alves et al., 2016). Additionally, research should examine the long-term effects of psychotropic use on postoperative functional status and quality of life, providing a broader perspective on patient-centered care.

5. Conclusion

The proposed study will be of great benefit since it is a prospective study that will give useful information on the perioperative management of medically ill patients on psychotropic medications. The primary value of the study is that it shows that the long-term intake of psychotropic drugs is related to a considerably high rate of early postoperative pain, higher rates of sedation, enhanced rates of delirium, and longer hospitalization times after elective surgery. The study provides an insight into how psychotropic pharmacotherapy may affect the postoperative recovery beyond the surgery or anesthesia through a systematic comparison of the outcomes with a matched control group of patients who do not take psychotropic medications. The effects of such findings are enormous. The available evidence can assist clinicians and perioperative teams in designing individualized recovery plans, conducting vigilant intraoperative monitoring, and implementing proactive interventions to prevent the oversedation and cognitive impairments of patients on psychotropic medications. This article highlights the significance of psychiatric history and medication use in the risk assessment and patient counseling in perioperative care. Also, the results indicate that the overall prescribing trends might have a potential impact on recovery processes and resource expenditure, including the length of stay and complication rates. The results of this research can be used to shape clinical pathways in a bid to strike a balance between safe surgical practices and management of mental health. It provides a base for future studies to understand specific interventions, such as dose changes or taper plans during perioperative times, that may reduce negative effects without affecting psychiatric stability. Moreover,

it raises the question of further research on the effect of psychotropic drugs on nociceptive and cognitive reactions in the course of recovery. Such insights will guide policies and collective decision-making, and eventually result in more individualized perioperative care to patients with complex psychiatric and medical conditions, as the number of elective surgeries across the world is ever-increasing. Finally, the study will help to make surgery safer and subtler in the new environment of multidisciplinary medicine.

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