Section: Anesthesiology

Original Research Article

PATTERNS OF ANALGESICS CONSUMPTION AMONG ADULTS FOR POST-SURGICAL PAIN RELIEF: EXPERIENCE FROM AN INDIAN TERTIARY CARE HOSPITAL

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Abstract

Background: Postoperative pain requires proper management to prevent complications. Analgesics play a crucial role in controlling postoperative pain. This study aimed to analyze analgesic usage patterns, evaluate their effectiveness and safety profile. The findings aim to improve understanding and guide effective strategies for postoperative pain management, reducing the risk of drug-related complications. **Materials and Methods:** A prospective observational study was undertaken over a duration of four months. A total of 145 patients were included in the study, and their analgesic usage was closely examined. Furthermore, the study sought to determine the impact of various sociodemographic factors and surgery-related variables on pain assessment scores and patient satisfaction scores. Additionally, an assessment of the safety profile associated with the administration of analgesics was conducted. **Result:** Diclofenac emerged as the most frequently prescribed analgesic, and the intramuscular route was the preferred method of administration. Approximately 70% of patients expressed satisfaction with their treatment, and a substantial majority did not experience any adverse effects. However, no significant associations were observed between various factors and pain assessment scores or patient satisfaction scores. **Conclusion:** Non-opioid analgesics, such as diclofenac, have been proven effective in managing post-operative pain and offer a cost-effective treatment option. The selection of an appropriate analgesic for post-operative pain should be made carefully, taking into consideration factors related to the patient and the specific surgical procedure. By considering these factors, healthcare professionals can enhance post-operative pain management and mitigate the risk of complications arising from the surgical intervention.

INTRODUCTION

According to the International Association for the Study of Pain, pain is defined as an unpleasant sensory and emotional experience linked to actual or potential tissue damage. Post-operative pain, categorized as acute pain, is a natural and anticipated response following medical procedures.[1,2]

Post-operative pain, if not effectively managed, can develop into chronic pain, leading to prolonged rehabilitation. Optimal post-operative pain management plays a significant role in improving patient outcomes following surgeries. Inadequate pain management can result in increased patient morbidity and extended hospital stays. Furthermore, complications such as delayed wound healing, atelectasis, and deep vein thrombosis may arise due to insufficient post-operative pain management.[3,4]

Undertreated severe post-operative pain can have physiological consequences, including an intensified stress response to surgical procedures. This can trigger a series of inflammatory, endocrine, and metabolic processes that may lead to organ dysfunctions. It is important to effectively manage post-operative pain to mitigate these potential cascades of physiological complications. Analgesics

are effective in managing post-operative pain by selectively alleviating pain sensation without significantly affecting consciousness. Different analgesics, belonging to various groups, vary in their mechanisms of action, side effects, and indications. Since pain perception is subjective, the analgesic requirement may differ among patients. Choosing an analgesic with high efficacy, a favorable safety profile, and a lower potential for tolerance, dependence, and drug abuse is crucial. Non-opioid analgesics are preferred worldwide due to their favorable risk-benefit profile. Combining non-opioid analgesics or combining them with opioid analgesics has been shown to have good efficacy in pain management.[5-7]

In contrast to acute painful conditions that are promptly addressed, severe post-operative pain is frequently overlooked and inadequately managed. The objective of effective post-operative pain management is multifaceted, encompassing patient satisfaction, restoration of functional ability, reduction of morbidity, and shortened hospital stays. Despite advancements in understanding pain pathways, mechanisms, the development of new analgesics, innovative drug delivery techniques, and minimally invasive surgeries, the optimal management of post-operative pain remains a challenging task.[8-10]

This study aimed to enhance understanding of post-operative pain management and factors impacting patient satisfaction. Objectives included studying the patterns of analgesic use, evaluating the effectiveness of prescribed analgesics, and assessing the safety profile associated with their use. Findings are expected to contribute to the existing knowledge on post-operative pain management, leading to improved patient outcomes and satisfaction.

MATERIALS AND METHODS

The present prospective observational study was conducted at a tertiary level hospital in India, adhering to established ethical principles.[11] The study spanned a duration of four months and involved the participation of 145 post-operative patients from the departments of general surgery, orthopedics, obstetrics, and gynecology.

The sample size for the study was determined based on a previously published study, where the proportion (P) of patients experiencing moderate-to-severe pain in the immediate postoperative period was reported as 43.48%.[12] Using a significance level (α) of 5%, a margin of error (ε) of 5%, a complement of the proportion ($q = 1 - p$), and an estimated sample proportion (n) of 151, the calculated sample size (n) was found to be approximately 110. The sampling technique employed in this study was convenient sampling.

A comprehensive assessment of post-operative pain relief was conducted on a total of 145 participants who satisfied the eligibility criteria and provided written informed consent. The inclusion criteria specified adult patients of both sexes, ranging in age from 18 to 80 years, who were undergoing major surgical procedures. On the other hand, certain exclusion criteria were applied, excluding patients with cognitive impairment, critically ill patients, and those who required intubation. By adhering to these criteria, the study aimed to gather detailed information on post-operative pain management in the selected participants.

A predesigned proforma was employed to collect data in this study. The proforma captured sociodemographic details, surgical information, type of anesthesia, pre-operative analgesia, prescriber details, post-operative analgesia (including medication, route, and dose), pre-anesthetic medication, and side effects of analgesics. The proforma facilitated systematic data collection, enabling comprehensive analysis of various aspects of post-operative pain management.

The study participants evaluated the intensity of post-operative pain using a 4-point verbal rating scale (VRS) as a subjective measure.[13] The VRS consisted of four scores representing different levels of pain intensity. A score of 0 indicated no pain, while a score of 1 represented mild pain. A score of 2 indicated moderate pain, and a score of 3 denoted severe pain. This standardized scale provided a structured approach to quantify and categorize the intensity of pain reported by the participants in the study. The effectiveness of analgesics in providing pain relief for post-operative pain was evaluated through a 4-point patient satisfaction score, which served as an indicator of their level of satisfaction with the pain management treatment.[14]

Descriptive statistics were employed to analyze the collected data, and the results were presented in the form of frequency and percentages, as deemed appropriate for the study. To examine the association between variables and pain assessment score as well as patient satisfaction score, the chi-square test was utilized. A significance level of $P < 0.05$ was considered statistically significant, indicating a meaningful relationship between the variables under investigation. This approach allowed for the identification of any statistically significant associations in the data analysis process.

RESULTS

[Table 1] offers a comprehensive representation of the demographic profile of the patient population under study. The findings indicate that individuals falling within the age range of 18 to 40 years constituted the largest segment of the sample. Furthermore, an examination of the gender distribution revealed a male to female ratio of 1.23:1. In terms of educational attainment, the majority of participants demonstrated literacy. Socioeconomic analysis demonstrated that a significant portion of the participants belonged to the lower income category.

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[Table 2] presents an extensive overview of the surgical procedures conducted within the study population. The data reveals that a majority of the surgeries performed were planned and executed using spinal anesthesia. Additionally, it is noteworthy that a significant proportion of these procedures took place within the Orthopaedics department.

The prescription of analgesics for post-operative pain management was carried out collaboratively by the treating surgeon and the anesthetist, ensuring comprehensive clinical consultation. Among the various analgesic options, Diclofenac emerged as the most frequently prescribed drug, both in monotherapy and as part of combination therapies. Following Diclofenac, Paracetamol and Tramadol were also commonly prescribed for post-operative pain management [Table 3].

In the current study, a significant proportion of patients reported experiencing moderate to severe pain levels. However, despite this pain intensity, the majority of patients expressed high levels of satisfaction with the prescribed analgesics, rating their satisfaction as good or excellent [Table 4].

Among the total of 145 patients included in the study, a majority of 125 patients reported experiencing no adverse effects as a result of the interventions. However, a subset of the participants experienced certain adverse effects. Specifically, 12 patients reported experiencing nausea, 5 patients reported vomiting, and 13 patients reported both headache and fever.

Table 1: Demographic details of study participants

Variable	Number of patients	%
Age group (in years)		
18 to 40	85	58.62
41 to 60	35	24.14
>60	25	17.24
Gender		
Males	80	55.17
Females	65	44.83
Education		
Illiterate	47	32.41
Literate	98	67.59
Socioeconomic condition		
Higher	3	2.07
Middle	46	31.72
Lower	96	66.21

Table 2: Details of surgical procedure done in study population

Details of surgical procedure	N	(%)
Department		
Orthopedics	52	35.86
Surgery	46	31.72
Obstretics and Gynaecology	47	32.41
Type of surgery		
Planned	110	75.86
Emergency	34	23.45
Type of Anesthesia		
General	2	1.38
Local	3	2.07
Spinal	140	96.55

Table 3: Pattern of analgesic usage for post-operative pain relief

Type of Analgesic	Orthopaedics	%	Surgery	%	Obstretics and Gynaecology	%
Diclofenac	9	4.96	37	19.83	7	3.54
Acetaminophene	12	6.37	0	0.00	13	7.08
Tramadol	1	0.71	4	2.12	13	7.08
Diclofenac+Acetaminophene	7	3.54	0	0.00	36	19.47
Diclofenac+Tramadol	4	2.12	4	2.12	5	2.83
Acetaminophene+Tramadol	14	7.79	0	0.00	16	8.85
Diclofenac+Acetaminophene+Tramadol	0	0.00	0	0.00	3	1.77

Table 4: Bivariate analysis of Post-Operative Pain

Variable	Pain Score				p Value
Age group (in years)	No pain	Mild	Moderate	Severe	
18 to 40	3	28	29	13	0.33
41 to 60	7	30	26	9	
>60	5	37	29	16	
Gender					
Males	4	13	14	3	0.58
Females	0	8	12	4	

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Education					
Illiterate	7	42	46	16	0.4
Literate	3	16	9	7	
Socioeconomic condition					
Higher	3	18	17	7	0.3
Middle	4	14	25	9	
Lower	3	25	13	7	
Department					
Orthopedics	8	46	39	17	0.34
Surgery	1	12	16	5	
Obstretics and Gynaecology	3	4	7	1	
Type of surgery					
Planned	9	47	40	15	0.35
Emergency	1	11	12	2	
Type of Anesthesia					
General	0	1	0	0	0.49
Local	0	1	0	0	
Spinal	7	51	48	21	
Type of Analgesic					
Diclofenac	3	26	17	7	0.52
Acetaminophene	1	7	4	1	
Tramadol	0	8	8	5	
Diclofenac+Acetaminophene	0	0	0	1	
Diclofenac+Tramadol	1	4	9	3	
Acetaminophene+Tramadol	3	9	9	0	
Diclofenac+Acetaminophene+Tramadol	1	4	8	5	

DISCUSSION

Despite significant progress in the realm of postoperative analgesia, the prevalence of post-operative pain remains high, leading to considerable morbidity and prolonged hospitalization, particularly in resource-constrained settings. Consequently, there exists a pressing need for a methodical investigation into the utilization of analgesics for post-operative pain management, aiming to effectively alleviate postoperative discomfort. This study aimed to evaluate the analgesic usage patterns for post-operative pain, assess their efficacy based on pain assessment scores and patient satisfaction scores, and investigate their safety.

The current investigation revealed that the incidence of post-operative pain was equally distributed between male and female patients (1:1). Interestingly, previous studies by Ogboli-Nwasoretal et al.[14] and Toro et al. [15] observed a higher occurrence of post-operative pain among females, whereas a study by Vallano et al.[16] reported a higher prevalence in males. The existence of gender-related variations in pain sensation can be attributed to diverse biological, social, and psychological factors.[17] Additionally, the mean age in this study was 41 years, consistent with the findings of the study conducted by Ogboli-Nwasoretal et al.

The most frequently prescribed drug for post-operative pain management in both monotherapy and combination therapy was diclofenac (60.9%), followed by paracetamol (41.8%) and tramadol (40.9%). This observation aligns with a similar pattern reported in a study by Kumarasingam et al.[18]. Diclofenac, a non-selective COX inhibitor, has proven efficacy in alleviating moderate-to-severe inflammation-induced pain. Its flexibility of administration via the parenteral route initially, followed by the oral route, confers an added advantage.[19] In this study, the preferred routes of administration were intramuscular (65%) and intravenous (56.36%), consistent with the findings of Ogboli-Nwasoretal et al. and Kumarasingam et al.

Regarding the patient distribution across specialties, 36% of patients were from orthopedics, 31% from OBG (Obstetrics and Gynecology), and 33% from general surgery. This distribution differs from the findings of Kumarasingam et al., who reported a higher representation of patients from general surgery and a lower number from orthopedics. Within the present study, 54% of patients experienced moderate-severe pain, with varying proportions in different departments: 41.6% from general surgery, 52.9% from OBG, and 65% from orthopedics. However, no significant associations were found between socio-demographic and surgery-related variables, analgesics used, and pain assessment scores.

Despite experiencing moderate-severe pain, 64% of patients expressed good to excellent satisfaction with the prescribed analgesics. A similar finding was reported by Kolawole et al.[20] Nonetheless, no significant association was observed between various factors and patient satisfaction scores.

Regarding safety, a vast majority of patients (94.55%) did not encounter any side effects following analgesic administration. Among the remaining patients, nausea (3.6%) was the most prevalent side effect, followed by vomiting (0.91%), headache (0.91%), and fever (0.91%). This side effect profile is consistent with the findings reported by Ogboli-Nwasoretal et al.[15]

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One of the main constraints is its single-center design, which restricts the generalizability of the findings. Extrapolating the results to a larger population may be challenging, as the study's outcomes could be influenced by the specific characteristics and practices of the particular healthcare setting in which it was conducted. Additionally, the sample size of the study may not be large enough to achieve optimal statistical power, potentially limiting the ability to draw definitive conclusions. A more extensive and diverse sample from multiple centers could strengthen the study's external validity and enhance the robustness of its findings. To address these limitations and further enhance the study's impact, future research endeavors could be conducted using a multi-center approach with a larger and more diverse population.

CONCLUSION

Our study findings indicated that non-opioid analgesics, such as diclofenac and paracetamol, offered satisfactory management of post-operative pain. These non-opioid analgesics were not only cost-effective but also demonstrated a superior safety profile compared to opioid analgesics like tramadol. The selection of the appropriate analgesic relied on several factors, including the type of surgery, patient's age, pain severity, and the preferences of the prescribers. It is crucial to emphasize that a careful and informed choice of post-operative analgesic is essential to enhance pain management and mitigate the risk of post-operative complications.

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