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Research Article

COMPARISON OF DIFFERENT DRUG REGIMENS USED IN POST-SURGICAL PAIN MANAGEMENT IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Objective: The current pain assessment and treatment does not address every patient's requirements. To establish the accurate diagnosis and determine the most effective treatment strategy for patients who arrive with pain, a precise and systematic pain evaluation is essential.

Methods: This was a retrospective study. A data collection form was used to collect demographic data, medications, surgery, and anesthesia, The visual analog scale (VAS) score was noted on days 1, 2, and 3 after surgery.

Results: The study was conducted from February 2021 to July 2021 in a tertiary care hospital in Pimpri-Chinchwad which comprised of 282 patients. There was not much difference in the mean age of the patients of either sex undergoing surgeries at the hospital which figured up to 48.22 years of the females and 48.68 years of the male patients. The VAS scores of males and females both were same for day 1 and day 3 post-surgery, while the average VAS scores for day 2 after surgery were 1.28 and 2.27 for females and males, respectively. Approximately 49.64% patients received paracetamol after surgery. About 24.46% of patients received paracetamol and diclofenac in combination, 8.51% of patients received paracetamol, diclofenac, and tramadol in combination.

Conclusions: Many patients continue to endure moderate pain in the post-operative period, despite the fact that there exist recommendations and ways for treating pain after surgical procedures. The use of different analgesics does not appear to make a meaningful difference in post-operative pain control.

Keywords: Postoperative pain management, Analgesics, Visual analogue scale, Pain scale.

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INTRODUCTION

The definition of pain as per international association for the study of pain is "an unpleasant sensory, emotional experience connected with existing or potential tissue damage, or explained in terms of such harm." Pain is a broad phrase that describes unpleasant sensations in the body. It is a predicted reaction to a surgical intervention that can affect the overall length of hospital stay [1].

Pain can be stabbing, cutting, stinging, burning, boring, splitting, colicky, crushing, gnawing, nagging, clutching, searing, shooting, or throbbing. It could be dull or sharp, regional or widespread, persistent, recurring, or chronic. It is frequently radiated. Cramping is a sort of pain that comes and goes (intermittently) or shifts in position or degree. Many women experience cramps during menstrual periods. Other subjective symptoms include soreness, agitation, and weariness. Insomnia, somnolence, and dizziness are all possible symptoms [2].

Quality treatment is regarded as a right of all patients and the responsibility of all hospital personnel. Effective post-operative pain control is a critical component of surgical patient care. Inadequate pain control may result in higher morbidity and mortality, in addition to being callous. Important aims for post-operative pain management include minimizing discomfort, facilitating recovery, and avoiding complications. Recognizing some of these issues, a special congressional mandate designated the years 2000–2010 as the decade of pain control and research, with the goal of increasing understanding and awareness of pain [3].

In 2001, the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) adopted pain management criteria that recognized patients' rights to proper pain assessment and management. Examples of implementation in the JCAHO guidelines include the addition of pain as the "fifth" vital sign to be documented in the context of initial assessment, the use of pain intensity ratings, and the posting of a statement on pain management in all patient care areas. JCAHO national patient safety goals, established in 2005, advocated for particular changes in the utilization of drugs and infusion pumps, among other things [4].

Post-operative pain, however, remains a critical necessity for many hospitals, despite several regulatory attempts and growing technological methods. When identifying possible areas for improvement, detailed information about patients' pain evaluations and whether pain treatment guidelines are met is critical aspects to evaluate. Pain intensity is regarded to be one of the key variables influencing pain's impact on a person's overall function and sense of well-being [5].

To establish the accurate diagnosis and determine the most effective treatment strategy for patients who arrive with pain, a precise and systematic pain evaluation is essential. Every year, almost 200 million major procedures are performed around the world. Despite the World Health Organization's recognition of pain alleviation and management as a fundamental human right, many patients experience moderate-to-severe pain during the post-surgical period. Post-operative pain management is a key concern for both clinicians and patients undergoing surgery. Patients frequently inquire about the level of discomfort they may experience following surgery. Postoperative pain not only has an impact on the patient's operative outcome, well-being, and satisfaction with medical care, but it also has a direct impact on the development of tachycardia, hyperventilation, decrease in alveolar ventilation, transition to chronic pain, poor wound healing, and

insomnia, all of which may have an impact on the operative outcomes. Pain is the most prevalent reason for discharge delay in patients after ambulatory surgery, followed by drowsiness and stomach problems. Because of the continuously rising number of sophisticated surgical procedures, post-operative pain management has become critical [6].

Inadequate post-operative pain control leads to a slower recovery. Patients with poorly controlled pain, for example, are frequently unwilling to mobilize, resulting in a slower restoration of function and rehabilitative capacity [7]. Inadequately controlled pain also has a detrimental impact on quality of life, function, and functional recovery, as well as the likelihood of post-surgical complications and persistent postsurgical pain. As a result, one of the most critical components of effective post-surgical patient care is post-operative pain control [8].

The primary goal of perioperative pain management is to provide patients with adequate comfort while minimizing side effects. Effective post-operative analgesia improves patient outcomes as measured by early ambulation, reduces side effects, and lowers the incidence of post-operative chronic pain [9]. Although the most surgical patients have immediate post-operative pain, research suggests that less than half receive sufficient post-operative pain relief. Managing immediate post-operative pain is a significant problem for practitioners, considering that more than 80% of patients feel pain after surgery, with 75% reporting moderate, severe, or even intense pain. More than half of patients indicate that they did not receive proper pain treatment following their procedure, raising worries about the development of chronic pain in the future [10].

In around 60–80% of instances, pain can be characterized as moderate or severe based on characteristics such as the type of surgery, pain-measurement method, time of assessment, and the patient's sex and age [11]. Despite the fact that post-operative pain management and its implications have received significant attention in health care over the past three decades, it remains a critical concern that is currently being ignored. Despite recent breakthroughs in pain management, the pain remains undertreated. Adequate post-operative pain management remains a major concern and patient satisfaction with pain management remains low. As a result, there is a need for regular auditing and assessment of post-operative pain management outcomes and patient satisfaction with various pain control techniques [12].

A visual analog scale (VAS) is a measurement scale that attempts to gauge a perspective that is expected to range throughout thousands of values and cannot be easily quantified directly (Fig. 1). It is used in clinical studies to assess the severity of pain. For example, a patient's level of discomfort can range from none to excruciating [13].

The pain VAS is a linear measure of pain intensity that has been widely utilized in a variety of adult groups. In this scale, the severity of pain is quantified using the individual's facial expressions and rated from 0 to 10. A higher score implies more intense pain. For example, if a patient is aware and smiling, he or she can be assigned a score of 0, indicating that the degree of pain is nil. They are mostly completed by patients; however, they are occasionally used to elicit opinions from health professionals. The patient draws a line through the location that they believe symbolizes their current state. The VAS score is calculated by measuring in millimeters from the left end of the line to the point marked by the patient [14].

Because of its simplicity and flexibility to a wide range of populations and settings, the VAS is widely employed. These scales are useful for assessing individual change. The VAS is completed in a matter of seconds. It does not require extensive training to use. It is more vulnerable to minor alterations. Due to minor translation issues, an unknown number of cross-cultural adaptations have occurred. However, judgment is clearly highly subjective, making it meaningless for comparing across a group of persons at a single point in time. It may be argued that a VAS is attempting to generate interval/ratio data from subjective values that are just ordinal at best. The VAS is measured with paper and pencil. As a result, it cannot be given verbally or over the phone. When photocopying the scale, take care not to vary the length of the 10-cm line; also, the same alignment of scale should be utilized consistently within the same patient [15].

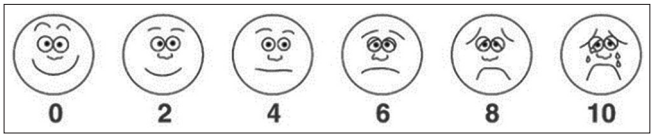

Fig. 1: The visual analog scale

METHODS

Study design

Ethical approval for this study was provided by the Hospital Ethics Committee. This was a retrospective and observational study that involved post-operative patients who underwent scheduled surgeries in the tertiary care hospital in Pimpri-Chinchwad over the past 6 months. The data were collected by all four members of the said group.

Patients and data collection

The data were gathered using the routine health information system (RHIS), a software program used in hospitals that collects data at regular intervals from public, private, and community-level health facilities, institutes, and health initiatives. The information provides an overview of health status, health services, and health resources. The hospital's medical record department keeps the patient file, which includes patient and treatment information. The data were acquired in person from the described system by the observers using pre-designed forms.

The following information was collected

1. Demographic details of the patient: Medical record number, name, age, and sex
2. Comorbidities
3. Diagnosis
4. Specifics about the surgery
5. Surgical department
6. Anesthesia used
7. Pain assessment scale score
8. Pain relief medications used
9. Discharge medications.

Patients over 18 years of age were included in the study. Furthermore, only participants who underwent major surgical procedures that required hospitalization were included in the study. The following patients were excluded from the study:

a. Patients below the age of 18 years
b. Pregnant women and
c. The patients who underwent chemotherapy and radiation therapy.

The main variable measured in the study was the VAS value (0–10) obtained at day 1, day 2, and day 3 following the end of the surgery. The collected data were entered into a Microsoft Excel file. This information was then organized into distinct pain-relief drug regimens.

Statistics

The analysis of variances (ANOVA) was used for statistical analysis. VAS results were presented as means (Tables 9 and 10). All measurements were performed using Microsoft Excel 2010 and one-way ANOVA calculator which was available online on website https://goodcalculators.com/one-way-anova-calculator.

RESULTS

Patients

The study was conducted from February 2021 to July 2021 in a tertiary care hospital in Pimpri-Chinchwad which comprised of 282 patients.

We had been granted a period of 6 months for the collection of data. The data wereas gathered using the RHIS, a software program used in hospitals that collects data at regular intervals from public, private, and community-level health facilities, institutes, and health initiatives.

The patient demographics are presented as means. There was not much difference in the mean age of the patients of either sex undergoing surgeries at the hospital which figured up to 48.22 years of the females and 48.68 years of the male patients. Approximately 40.42% of patients were females and 59.57% of patients were of male gender. The data regarding this are presented in Table 1.

The VAS scores of males and females both were same for day 1 and day 3 post-surgery, while the average VAS scores for day 2 after surgery were 1.28 and 2.27 for females and males, respectively. The data pertaining to this are given in Table 2 and Fig. 2.

Type of surgical ward

The maximum numbers of patients undergoing surgery were found to be in the neurology department while the least was found to be in the transplant department. Excluding the OBG department, the number of female patients undergoing surgeries in various departments was consistently less than the male patients. Except the cardiology department, the average age of the patients undergoing surgeries in various departments was approximately 47.48 years while those in cardiology department were found to be between 50 and 60 years of age. The data regarding this are presented in Table 3.

The patients in the transplant department were found to have experienced maximum pain according to their VAS scores whereas, the patients from the cardiology department were found to have experienced the least pain followed by the OBG department. The data are shown in Table 4 and Fig. 3.

Type of anesthesia

The types of anesthesia that were performed in our study were divided into following groups:

General Anesthesia (GA), Spinal Anesthesia, Nerve Block Anesthesia, General+Epidural Anesthesia, General+Spinal Anesthesia, General+Nerve Block Anesthesia, and Spinal+Nerve Block Anesthesia. It was found that the usage of GA was approximately 74.73% which was the highest, while Spinal+Nerve Block Anesthesia use accounted to 0.71% which was the lowest. The data are illustrated in Table 5.

Table 1: Demographics of patients

Gender	Number	Percent	Mean age
Female	114	40.42	48.22
Male	168	59.57	48.68
Overall	282	100	48.5

Table 2: Pain severity according to the patient sex

Gender	Average VAS scores		
	Day 1	Day 2	Day 3
Female	3.33	1.28	1.56
Male	3.33	2.27	1.56

VAS: Visual analog scale

It was found that the patients anesthetized with GA+Epidural Anesthesia experienced the most severe pain while those anesthetized with Spinal+Nerve Block experienced the least pain. The data are displayed in Table 6 and Fig. 4.

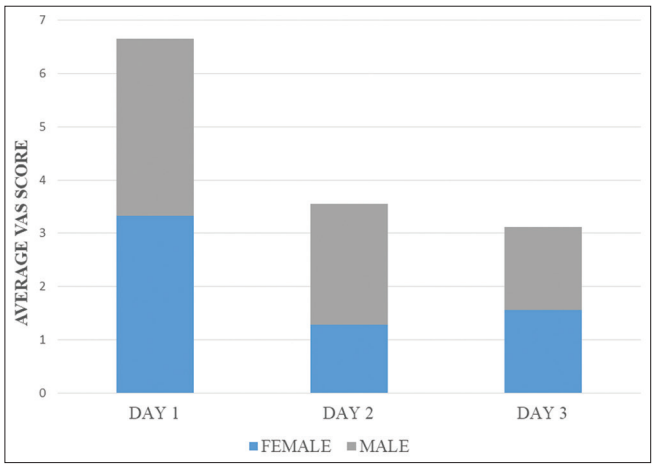

Fig. 2: Visual analog scale scores according to the patient sex

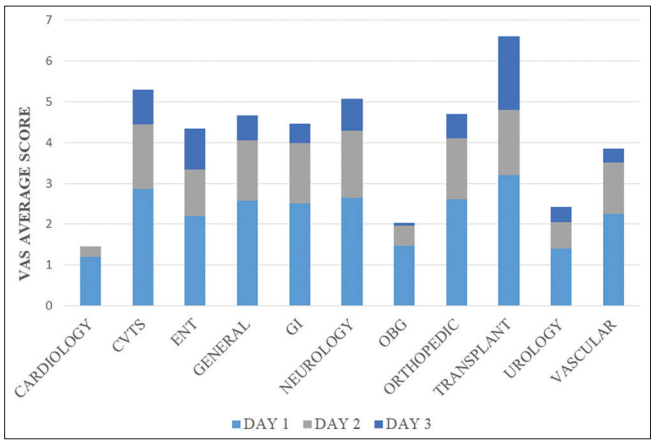

Fig. 3: Visual analog scale score according to the type of surgical department

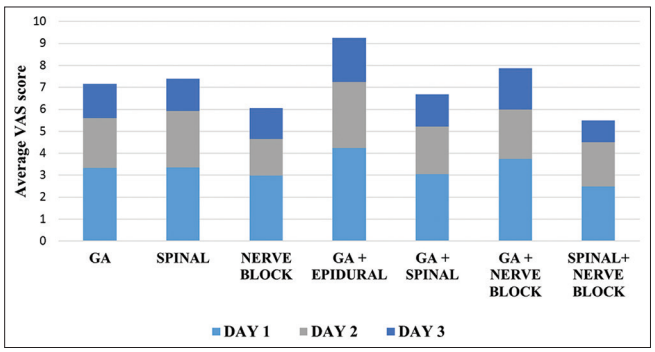

Fig. 4: Visual analog scale score according to the type of anesthesia

Table 3: Sex-wise and age-wise distribution of patients according to the type of surgical ward

Department	Cardiology	CVTS	ENT	General	GI	Neurology	OBG	Orthopedic	Transplant	Urology	Vascular
Number of patients	5	23	40	35	35	44	19	31	5	29	16
Patients' sex f/m	2/3	7/16	17/23	13/22	11/24	18/26	19/-	12/19	2/3	7/22	6/10
Patients mean age	58.6	52.5	43.1	49.1	46.4	49.6	45.2	52.5	36.2	49.5	50.75

CVTS: Cardiothoracic and vascular surgery, GI: Gastrointestinal

Post-operative analgesics

For statistical analysis, to avoid bias, with the smaller number of cases in some groups, patients were assigned to five regimens. The types of analgesics that were included in the study are listed below:

- Regimen 1: Paracetamol
- Regimen 2: Paracetamol+Diclofenac
- Regimen 3: Paracetamol+Diclofenac+Tramadol
- Regimen 4: Paracetamol+Tramadol
- Regimen 5: Paracetamol+Diclofenac+Cyclofenil.

Approximately 49.64% of patients received paracetamol after surgery. About 24.46% of patients received paracetamol and diclofenac in combination, 8.51% of patients received paracetamol, diclofenac, and tramadol in combination. Around 10.28% of patients received paracetamol and tramadol in combination. By far paracetamol, diclofenac, and aceclofenac combination was the least frequently administered analgesic for post-surgical pain. The data are represented in Table 7.

The VAS score of the patients receiving Regimen 4 was found to be highest, indicating severe pain while that of patients receiving Regimen 5 was the least. Regimen 1, 2, and 3 showed similar pain-relieving effect according to their VAS scores. On the post-operation day 1, 2 and 3, no significant difference was noted between the VAS measurements of any of the regimen groups. This data are shown in Table 8 and Fig. 5.

Table 4: Pain severity according to the type of surgical department

Department	Average VAS scores		
	Day 1	Day 2	Day 3
Cardiology	1.2	0.25	0
CVTS	2.86	1.59	0.85
ENT	2.2	1.15	1
General	2.57	1.48	0.62
GI	2.51	1.48	0.48
Neurology	2.65	1.65	0.78
OBG	1.47	0.5	0.06
Orthopedic	2.61	1.5	0.6
Transplant	3.2	1.6	1.8
Urology	1.4	0.65	0.38
Vascular	2.25	1.26	0.35

VAS: Visual analog scale, CVTS: Cardiothoracic and vascular surgery, GI: Gastrointestinal

Table 5: Patient distribution according to the type of anesthesia

Type	Number (n)	Percent
GA	210	74.73
Spinal	24	8.54
Nerve Block	12	4.27
GA+Epidural	4	1.42
GA+Spinal	21	7.47
GA+Nerve Block	8	2.84
Spinal+Nerve Block	2	0.71

GA: General anesthesia

Table 6: Pain severity according to the type of anesthesia

Type of anesthesia	Average VAS Scores		
	Day 1	Day 2	Day 3
GA	3.33	2.27	1.56
Spinal	3.36	2.56	1.48
Nerve Block	2.99	1.66	1.41
GA+Epidural	4.25	3	2
GA+Spinal	3.05	2.17	1.47
GA+Nerve Block	3.75	2.25	1.87
Spinal+Nerve Block	2.5	2	1

GA: General anesthesia, VAS: Visual analog scale

Table 7: Prevalence of analgesics used in the study

Postoperative Analgesics	Number	Percent
Paracetamol	140	49.64
Paracetamol+Diclofenac	69	24.46
Paracetamol+Diclofenac+Tramadol	24	8.51
Paracetamol+Tramadol	29	10.28
Paracetamol+Diclofenac+Aceclofenac	20	7.09

DISCUSSION

The prevalence of moderate-to-severe pain was significant in the study population, particularly on the 1st day following the surgery. Approximately 59.57% of male patients underwent surgery out of 282 patients. The average pain score of male patients seemed to be greater than that of females.

The neurology department had the highest number of patients receiving surgery, while the transplant department had the lowest. With the exception of the OBG department, the number of female patients receiving surgery in other departments was consistently lower than the number of male patients. Except for the cardiology department, the average age of patients undergoing surgery in other departments was roughly 47.48 years, with those in the cardiology department ranging in age from 50 to 60 years.

Table 8: Pain severity according to the regimen

Regimens	Average VAS Scores		
	Day 1	Day 2	Day 3
Regimen 1	3.314	2.278	1.561
Regimen 2	3.188	2.086	1.463
Regimen 3	3.265	2.458	1.625
Regimen 4	3.689	2.62	1.793
Regimen 5	3.05	2	1.35

VAS: Visual analog scale

Table 9: Data evaluated for the interpretation of the statistics

POD	Average VAS scores±SD				
	Regimen 1	Regimen 2	Regimen 3	Regimen 4	Regimen 5
Day 1	3.314±1.24	3.188±1.40	3.265±1.20	3.689±0.92	3.05±1.23
Day 2	2.278±0.99	2.086±1.13	2.458±1.02	2.62±0.90	2±0.97
Day 3	1.561±0.80	1.463±0.73	1.625±0.76	1.793±0.94	1.35±0.58

VAS: Visual analog scale

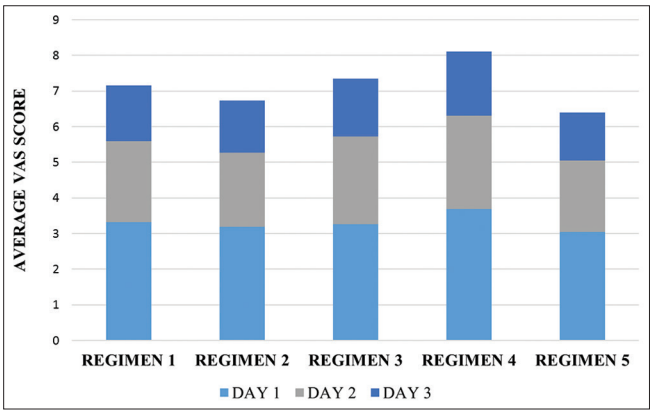

Fig. 5: Visual analog scale score according to the regimen