

Postoperative Pain Management and Patient Satisfaction in an Indian Tertiary Care Centre-A Prospective Observational Study

ANWESHA BANERJEE¹, ASHOK K SAXENA², NEHA BHARDWAJ³, MOHIT K SRIVASTAVA⁴

ABSTRACT

Introduction: Despite various advancements over last two decades in pain medicine, post-operative pain remains inadequately addressed, even in a tertiary medical center. There are very limited studies addressing post-operative pain management in India. Few published studies have assessed post-operative pain, but only at 24 hours intervals, and utilising tools focusing on any one parameter of pain. Hence, a holistic assessment using four different pain assessment tools should be done to get a wider overview of the condition.

Aim: To assess the intensity and severity of post-operative pain at 6, 12, 24 & 48 hours postoperatively for patients undergoing surgery for orthopaedics, gastrointestinal, general surgery, obstetrics & gynaecological ailments and patient satisfaction at 24 hours postoperatively.

Materials and Methods: A prospective observational survey was conducted at a tertiary care centre of New Delhi from October 2020 to October 2021. Three scales were used to determine the status of post-operative pain at 6,12,24 and 48 hours follow-up. The three different pain scales were Numerical Pain Rating

Scale (NRS-pain) static and dynamic, Global Perceived Effect (GPE) and Neuropathic Pain System Inventory (NPSI).

Results: Total of 400 patients, with mean age of the study population was 43.26±4.98 years. Majority were males, 250 (60%) and of ASA Grade I, 208 (52%). Significant improvement was observed in the NRS pain score at each follow-up among those undergoing orthopaedic surgery, general surgery, and gynaecological procedures. Improvement in the mean GPE scale was only seen for orthopaedic surgeries. There was a significant neuropathic pain component observed in all the surgeries except gynaecological surgeries. Majority 321 (80.25%) had received information about their pain treatment but only 174 (43.5%) were satisfied with their pain treatment.

Conclusion: A majority of the patients undergoing orthopaedic or general surgery, and gynaecological procedures had improvement in pain. This survey highlights the need for investigating future post-operative pain management protocols so that the intensity of post-operative pain, incidence of chronic persistent pain & resulting suffering, as well as disability, can be minimised to a large extent.

Keywords: Global perceived effect, Numerical pain rating scale, Neuropathic pain system inventory

INTRODUCTION

Pain is now the fifth vital sign according to the latest published clinical guidelines [1,2], thus requires adequate clinical significance, good patient care, a quick response team, and a holistic management approach [3-6]. Pain management should not be considered a social commitment to the patient; it is an essential humanitarian need of every surgical procedure. Inadequate and under-treated pain may result in increased morbidity and mortality [7,8]. Post-operative pain gives the patient a traumatising memory and is equally dangerous as intraoperative awareness. As long as the surgery is successful, pain is considered a phenomenal event following surgery and is often neglected.

There have been worldwide surveys focusing on medical, ethical, and legal trends and initiatives related to the concept of pain management as a human right. Reasons for deficiencies in pain management include cultural, societal, religious, and political attitudes, including acceptance of torture [9]. It was concluded in a multi-centric study that, because pain management is the subject of many initiatives within the disciplines of medicine, ethics, and law, the authors are at an "inflection point" in which unreasonable failure to treat pain is viewed worldwide as poor medicine, unethical practice, and an abrogation of a fundamental human right [9]. According to a survey conducted in Poland among seven hospitals in 2016, pain control seems to be unexpectedly poor in majority of centers [10]. Thus, despite World Health Organisation (WHO) proclaiming pain relief as a fundamental human right, unfortunately, many surgical patients experience moderate to severe pain in the post-operative period.

Although worldwide attention is being paid to peri-operative patient care, there is paucity of similar evidence from India. Few published studies have assessed post-operative pain, only at 24 hours intervals, and utilising tools focusing on any one parameter of pain [7,8]. Hence, a holistic assessment using four different pain assessment tools should be done to get a wider overview of the condition. Studies assessing the neuropathic components of post-operative pain, are also scarce in India. Moreover, very limited studies in the past have assessed post-operative pain at varying intervals-6, 12, and 24 and 48 hours but there were methodological flaws. Although a similar study has been reported from India, but pain beyond 24 hours was not assessed, and only neuropathic component of post-operative pain was studied using the NPSI [11].

Hence, the aim of this study was to conduct a detailed 48-hour follow-up of patients undergoing different surgeries, to evaluate the post-operative pain management at the tertiary healthcare center and assess the patient satisfaction as well as perception of the healthcare providers. The primary objectives were to assess the intensity and severity of post-operative pain at 6, 12, 24 and 48 hours postoperatively. The secondary objectives were to assess the presence, intensity, and severity of the neuropathic component of post-operative pain and assess the overall patient satisfaction at 24 hours postoperatively.

MATERIALS AND METHODS

A prospective observational study was conducted at a University of Medical Sciences, Delhi from October 2020 to October 2021. This survey was conducted in compliance with the ethical standards of the Institutional Ethical Committee (HR/2020/37/5R).

Inclusion criteria: ASA (American Society of Anesthesiologists) grade 1 and 2 patients undergoing elective surgery for orthopaedics, gastrointestinal, general surgery, obstetrics & gynaecological ailments, consented to participate and cooperated, were included in the survey.

Exclusion criteria: Patients with age <18 years, requiring Intensive Care Unit (ICU) care, with co-morbidities like diabetes mellitus, hypertension, bronchial asthma, renal disease, and cardiac diseases, underwent multiple surgical operations and incidence of infections were excluded.

Sample Size estimation: For calculating sample size, the formula used was $X = Z_{\alpha/2}^2 * p(1-p)/d^2$, where $Z_{\alpha/2}$ is the critical value of the normal distribution at $\alpha/2$ (for a confidence level of 95%, $\alpha=0.05$ and the value is 1.96), p is the prevalence of moderate post-operative pain {Numerical Rating Scale (NRS)=4-6.5} (40.83%) observed at fifth post-operative hour, d is the Margin of error for 5% level of precision, the final sample is 390 patients [11]. Total 400 subjects were enrolled in this study.

Procedure

Tools for Data Collection: The doctors taking the survey were not involved in any form of intervention like administering analgesics, thus minimising bias. Patients were explained about the survey and a Patient Information Sheet (PIS) in English and Hindi was handed over to them before taking their complete written informed consent. Strict confidentiality was assured to the patients. Those who signed the consent were taken-up for the survey and were asked a few questions regarding the presence or absence of pain, the intensity of pain, type of pain, and other associated symptoms.

Questionnaire: It was prepared according to the American Pain Society Patient Outcome Questionnaire-Revised (APS-POQ-R) (12-Parameter considered) [6]. It included three different pain scales keeping in mind different types of pain:

- 1) Numerical Pain Rating Scale (NRS-Pain) [12];
- 2) Global Perceived Effect (GPE) [13]; and
- 3) Neuropathic Pain System Inventory (NPSI) (12-Parameter considered) [14].

The patient proforma was filled by doctors and hence designed in one language only, i.e., English. The participants were assessed at different time intervals-6 hour, 12 hour, 24 hour, and 48 hour post-operatively for pain severity, type, associated with body movements like sitting, changing posture on bed, standing, walking, and going to the toilet. A pre-tested semi-structured questionnaire was used to assess patients' level of satisfaction.

STATISTICAL ANALYSIS

All data were analysed in Statistical Package for Social Sciences (SPSS) 20.0. Descriptive summary using frequencies, percentages, graphs, mean, and standard deviation will be used to present study results. Probability (p) will be calculated to test statistical significance at the 5% level of significance. Categorical variable will be analysed using chi-square test. Continuous variable will be calculated using independent t-test. Regression analysis will be done to establish association between independent and dependent variables.

RESULTS

Among the 400 patients in this study, mean age was 43.26 ± 4.98 years. Majority was males 250 (60%) and of ASA Grade I 208 (52%). A majority had undergone 150 (40%) orthopaedic surgery followed by gastro-surgery and obstetrics and gynaecology surgery 100 (25%) [Table/Fig-1].

Baseline data		Mean \pm SD (Years)	N (%)
Age (years)		43.26 \pm 4.98	-
Gender	Male	-	250 (60.0)
	Female	-	150 (40.0)

American Society of Anaesthesiology (ASA) grade	I	-	208 (52.0)
	II	-	192 (48.0)
Type of surgery	Orthopaedic surgery	-	150 (40.0)
	Gastro-surgery	-	100 (25.0)
	General surgery	-	50 (12.5)
	Obstetrics and gynaecology	-	100 (25.0)

[Table/Fig-1]: Baseline data of the study participants (N=400).

The mean NRS Pain score was observed to be lowest at 48 hours post-operatively and it was 5.56 ± 1.23 , 6.23 ± 1.48 , 5.23 ± 0.54 and 5.89 ± 1.82 in those with orthopaedic, gastro-surgery, general surgery and obstetrics and gynaecology at 48 hours. Significant improvement was seen in orthopaedic surgery, general surgery and obstetrics and gynaecology [Table/Fig-2]. The mean global pain effect score was significantly improving in the patients who underwent orthopaedic surgery. The score was 6.86 ± 0.12 , 6.23 ± 0.23 , 5.89 ± 0.86 and 4.23 ± 1.04 at 6, 12, 24 and 48 hours, respectively [Table/Fig-3]. The mean NPSI score was significantly improving in the orthopaedic surgery, gastro-surgery and general surgery [Table/Fig-4].

Follow-up (hours)	Orthopaedic Surgery	Gastro-surgery	General surgery	Obstetrics and gynaecology
6	8.87 \pm 1.06	8.52 \pm 2.35	7.35 \pm 2.56	7.85 \pm 1.96
12	8.23 \pm 1.45	8.13 \pm 1.56	6.56 \pm 1.12	7.32 \pm 1.13
24	7.68 \pm 0.86	7.52 \pm 1.05	5.84 \pm 1.67	6.23 \pm 1.42
48	5.56 \pm 1.23	6.23 \pm 1.48	5.23 \pm 0.54	5.89 \pm 1.82
p-value	0.041	0.221	0.012	0.001

[Table/Fig-2]: Mean NRS-Pain score at various follow-ups.

Follow-up (hours)	Orthopaedic surgery	Gastro surgery	General surgery	Obstetrics and gynaecology
6	6.86 \pm 0.12	6.02 \pm 0.56	5.98 \pm 0.64	6.54 \pm 0.21
12	6.23 \pm 0.23	5.67 \pm 0.43	5.65 \pm 0.45	6.06 \pm 0.23
24	5.89 \pm 0.86	5.23 \pm 1.13	4.94 \pm 1.02	5.76 \pm 0.59
48	4.23 \pm 1.04	4.86 \pm 0.87	4.12 \pm 0.78	4.53 \pm 0.39
p-value	0.003	0.321	0.267	0.541

[Table/Fig-3]: Mean global pain effect score at various follow-ups.

Follow-up (hours)	Orthopaedic surgery	Gastro surgery	General surgery	Obstetrics and gynaecology
6	10.56 \pm 0.56	10.23 \pm 0.34	10.27 \pm 0.67	10.69 \pm 0.27
12	10.05 \pm 1.02	9.98 \pm 0.64	9.67 \pm 0.62	10.35 \pm 0.73
24	9.32 \pm 0.48	9.34 \pm 0.53	8.79 \pm 0.82	10.12 \pm 1.14
48	8.89 \pm 0.68	8.27 \pm 1.14	8.14 \pm 0.63	9.26 \pm 0.95
p-value	0.033	0.01	0.001	0.452

[Table/Fig-4]: Mean NPSI score at various follow-ups.

Majority patients (80.25%) had received information about their pain treatment but only 43.5% were satisfied with their pain treatment. 55.75% had participated in the decisions related to their pain management. 51.25% complained that post-operative pain prevented them from regular activities. 47.25% had worst pain in 24 hours [Table/Fig-5,6].

Follow-up (hours)	NRS-Pain	Global pain score	NPSI
6	8.89 \pm 1.18	6.91 \pm 1.12	10.11 \pm 1.26
12	8.01 \pm 1.15	6.89 \pm 0.87	10.17 \pm 1.07
24	7.18 \pm 1.78	5.09 \pm 0.98	9.81 \pm 0.92
48	5.06 \pm 1.03	4.90 \pm 1.84	8.16 \pm 1.34
p-value	0.01	0.045	0.042

[Table/Fig-5]: Overall mean values of the three scales. NPSI: Neuropathic pain system inventory

Patient satisfaction	N (%)
Least pain in the first 24 hours	42 (10.51)
Worst pain in the first 24 hours	189 (47.25)
Severe pain in the first 24 hours	78 (19.52)
Pain prevented you from doing regular daily activities	205 (51.25)
Had any side-effects related to surgery	112 (28.0)
Received pain relief	134 (33.5)
Participated in the decisions related to your pain management	223 (55.75)
Satisfied with the results of your pain treatment	174 (43.5)
Received information about your pain treatment	321 (80.25)

[Table/Fig-6]: Patient satisfaction (N=400).

DISCUSSION

In the post-operative period following surgery, the patients experience pain of different types, magnitude and intensity depending on various factors. The post-operative pain can be acute or chronic. Acute pain is experienced immediately after surgery (up to 7 days) and pain that lasts for more than three months after surgery is chronic.

In the following study, the mean NRS Pain score was high at 6, 12 and 24 hours post-operatively while lowest was observed at 48 hours among those with orthopaedic, gastro-surgery, general surgery and obstetrics and gynaecology. Similarly in a study by Venkatesan U et al., severe pain was felt by nearly all (70%) among general surgery patients, 60% in orthopaedic surgery patients and 50% had moderate pain in urological surgery patients respectively post-operatively [15]. Subramanian P et al., also reported in their study that majority of respondents reported severe pain in the first 24 hour post-surgery [16]. One study highlighted that high pain output scores might indicate that inadequate doses of analgesics were given to the patients after surgery [17]. Poorly managed pain during post-operative period not only results in discomfort and suffering of patients, but also associated with many complications [18].

The mean global pain effect score was significantly improving in the patients who underwent orthopaedic surgery and the pain was significantly less after 48 hours post-operatively. Results of this study were inconsistent with study by Venkatesan U et al., also reported that majority (60%) of the patients who underwent orthopaedic surgery had severe pain post-operatively but 88% had a positive attitude towards pain management [15]. This discrepancy in severity of pain and attitude has been explained by few researchers-there was a significant association with patient information about the disease and attention of operation theatre staff to the patients' complains [15,19,20]. However, Venkatesan U et al., stated that that there was no relationship between severity of pain and type of surgery [15].

The present study reported neuropathic pain post-operatively among the patients who underwent orthopaedic surgery, gastro surgery and general surgery, respectively and pain did not reduce significantly even after 48 hours. There is paucity of evidence regarding the neuropathic pain post-operatively. Due to central sensitisation, neuropathic pain takes time to relieve [2,3].

Less than half (43.5%) patients in this study were satisfied with the post-operative pain management. This is very less in comparison to study by Bizuneh YB et al., who reported that overall patients who were satisfied with pain management service were 72.2%. The patient satisfaction can be gained by good caring attitude of healthcare professionals, preoperative pain education, presence of good communication, and providing frequent education on pain related issues from the ward nurses, especially focusing on the frequent measurement of pain assessment [21]. Gordon B et al., has observed that satisfaction among patients on nursing care was reported as the most essential influencer of the overall satisfaction with hospital care and an important aim of any healthcare organisation [22]. The strength of this study is that it has tried to study the

relationship between severity of pain and type of surgery. Moreover, the neuropathic component of pain was studied in this research.

Limitation(s)

The patients were selected non randomly which poses the risk of selection bias and compromise of the external validity.

CONCLUSION(S)

More than half the patients recruited had persistent post-operative pain of moderate intensity, reflecting that pain management after surgery is a neglected area in the healthcare system. This survey was conducted for investigating future post-operative pain management protocols so that the intensity of post-operative pain, incidence of chronic persistent pain and resulting suffering, as well as disability, can be minimised to a large extent.

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PARTICULARS OF CONTRIBUTORS:

1. Senior Resident (Pain Post Doctoral Advanced Fellowship), Department of Anaesthesiology, SGPGIMS, Lucknow, Uttar Pradesh, India.
2. Professor and Former Head, Department of Anaesthesiology, Critical Care and Pain Medicine, UCMS and GTB Hospital, New Delhi, India.
3. Senior Resident (DNB Critical Care Medicine), Department of Anaesthesia and Critical Care, Army Hospital Research and Referral (R&R), New Delhi, India.
4. Senior Resident (DM Pain Medicine), Department of Physical Medicine and Rehabilitation, AIIMS, Rishikesh, Dehradun, Uttarakhand, Uttarakhand, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Mohit K Srivastava,
Senior Resident (DM Pain Medicine), Department of Physical Medicine and Rehabilitation, AIIMS, Rishikesh, Dehradun, Uttarakhand-249203, India.
E-mail: rohitsriv14elec@gmail.com

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