

Evaluation of length of hospital stay in post operative patients with respect to ASA grade and post-operative analgesic.

Aparna Nair¹, Abins Raju², Dr. Rajveer Singh³

¹(Department of pharmacy practice, Nims Institute of Pharmacy, India)

²(Department of pharmacy practice, Nims Institute of Pharmacy, India)

³(Assistant professor, Department of pharmacy practice, Nims Institute of Pharmacy, India)

Abstract:

Introduction : The length of hospital stay has been used as a checkmark in the quality of healthcare provided. While various factors can influence the number of days ASA grade has been of major part in post-operative patients. The choice of right post-operative analgesia used has been associated with improved patient outcomes throughout the world. Evaluating its effect on length of hospitalization can help determine the right analgesic to an extent.

Materials and methods : 94 patients from orthopedic ward who were about to undergo surgery and under ASA grade III or below were enrolled in a prospective observational study based on inclusion and exclusion criteria. Post-surgery the patients were divided into two groups based on analgesic administered. The length of hospitalization was recorded. Statistical analysis was done using SPSS v 22.0

Results : The length of stay (LOS) was found to be greatest in patients of ASA grade III at a mean of 7.3 ± 2.08 days followed by ASA grade II at 4.85 ± 1.78 days and ASA grade I at 4.28 ± 1.77 days. Patients administered parenteral opioid had an average LOS at 4.9 ± 1.77 days while those administered NSAID were at 4.0 ± 1.8 days.

Conclusion: Patients of ASA grade III spent the most number of days in the hospital while patients on parenteral opioid had loner length of hospitalization.

Keywords: Length of hospital stay, post-operative, ASA grade, analgesic.

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I. Introduction

Length of hospital stay refers to the number of days the patient spends in the hospital from the date of admission to the date of discharge. The length of hospital stay has influenced various factors including the financial aspect of hospitalization. Hence it is of great importance to the hospital as an institution and to the individual as a patient.^{1,4}

Over the years many predictive factors have been identified which seemed to affect the length of hospital stay in patients. While there have been no correlation to gender, BMI or such physical characteristics various other factors have been associated with length of hospitalization in post-operative patients such as ASA grade, procedure performed, post-operative condition of the patient, etc.²The American Society of Anesthesiologists (ASA) physical status classification system was developed to predict pre-operative risk of a patient by forming a simple categorization.⁶ASA grading of a patient has been keenly associated with operating times, length of hospital stay, post-operative infection rate, overall morbidity and overall mortality following orthopedic, gastrointestinal, cardiac and genitourinal surgeries as proven through various studies.¹⁰Post-operative pain is often acute. If untreated post-operative pain can lead to physiological impairment and affect the quality of life of the patient as well as their subsequent recovery. Thus effective postoperative pain control can lead to decrease in length of hospital stay, increased patient satisfaction and faster patient recovery.³

II. Materials and Methods

A prospective observational study was carried out on 94 patients in the orthopedic department of NIMS medical college and hospital. The study was conducted for a duration of 6 months and was approved by the Institutional Ethical Committee of NIMS university. A total of 94 patients were enrolled in the study after obtaining informed consent and by considering the inclusion and exclusion criteria. Subjects below the age of 18 and above the ASA grade III were excluded from the study. Data was collected included the socio-demographic details of the patient, medical and surgical history, Post-operative analgesic used and length of hospital stay. Post-surgery the patients were either administered parenteral tramadol or parenteral diclofenac as post-operative

analgesic. The patients were then observed throughout the length of hospital stay. Data obtained was analyzed using SPSS version 22.0.

III. Results

ASA grade

Table no 1. Distribution of ASA grades among the subjects involved.

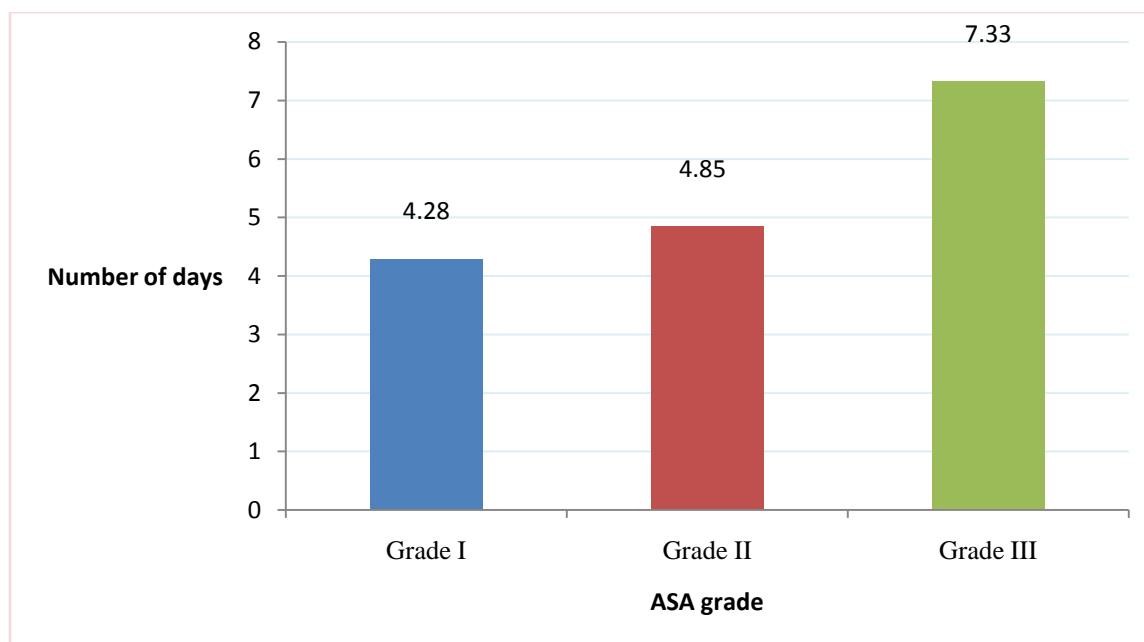
ASA grade	Number of patients
I	65 (69%)
II	26 (28%)
III	3(3%)

Table no 1 shows the distribution of ASA grade in the study population. The number of patients classified as ASA grade I were 65, ASA grade II were 26 and ASA grade III were 3. Most patients admitted were of ASA grade I.

Length of hospital stay in relation to ASA grade

Table no 2. Length of hospital stay with respect to ASA grade.

ASA grade	Length of hospital stay (Mean days \pm S.D)
Grade I	4.28 \pm 1.77
Grade II	4.85 \pm 1.78
Grade III	7.3 \pm 2.08

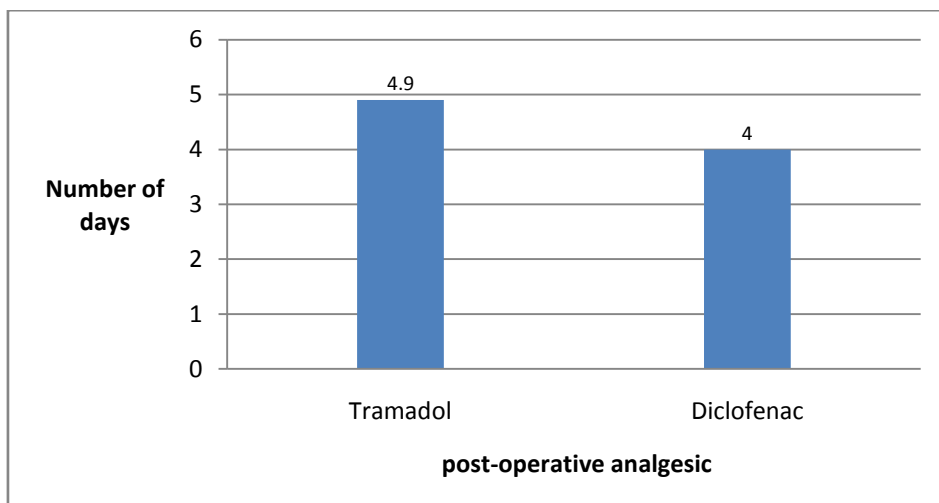


The above table (Table no 3) and graph shows variation in length of hospital stay with respect to ASA grades observed in the patients. The length of hospital stay varied from 1 day to 10 days among the subjects with a median of 4 days. ASA grade I patients had an average length of hospital stay of 4.28 days, ASA grade II patients had an average of 4.85 days and ASA grade III patients had an average of 7.33 days. The correlation variable was found to be 0.268 with a significance of less than 0.05.

Length of hospital stay and post-operative analgesic administered

Table no 3. Length of hospital stay with respect to analgesic administered.

Post-operative analgesic	Length of hospital stay (Mean days \pm S.D)
Tramadol	4.9 \pm 1.77
Diclofenac	4.0 \pm 1.8



The above table (Table no 3) and graph shows the difference in length of stay with respect to analgesic used post-operatively. The group that were given parenteral tramadol as post-operative analgesic had the length of stay as 4.9 ± 1.77 days. Meanwhile the subjects administered parenteral diclofenac as post-operative analgesic had the mean length of stay as 4.0 ± 1.8 days.

IV. Discussion

The length of stay has always been associated with the quality of care provided by the specific healthcare system involved. Along with readmission rates, mortality and patient satisfaction it has been a measuring stick to evaluate the mental, physical and financial well-being of the patient. Thus reduced LOS has always been an indicator to effective management of the healthcare system.⁵

ASA grade has been keenly associated with length of hospital stay in orthopedic patients. Van Den Belt et. al (2014)¹⁸ in their study on 240 patients who had undergone total knee arthroplasty suggested that ASA scores were significant predictive factors of LOS. In that study Grade I patients had a mean LOS of 4. Grade II had a mean LOS of 5 and Grade III patients had a mean LOS of 6. These values were similar to this study where ASA grade I patients had an average length of hospital stay of 4.28 days, ASA grade II patients had an average of 4.85 days and ASA grade III patients had an average of 7.33 days. Grade III patients had the highest length of stay in the hospital similar to McDonald et.al (2013).¹⁰

Various studies have explored the relation between post-operative analgesic used and the length of hospitalization in post-operative patients. The type, frequency and route of administration of different post-operative pain medication analgesics has been compared in relation to length of stay.⁷

This study focused on an opioid analgesic and a NSAID analgesic specifically. These were chosen due to their availability and class of action. Those administered parenteral tramadol had an average LOS of 4.9 days while those administered parenteral diclofenac had 0.9 days lesser at an average of 4 days of hospitalization.

Analysis of various literatures has shown a proportional relation between post-operative use of opioid and increased length of stay.^{8,9,11,12} This varied among the opioid analogues as well as the duration of therapy.²⁰ Some studies have also analyzed the relation between preoperative opioid use and the length of stay.^{15,24} Most of the literature were factored around the ability of opioid to cause dependence as well as increased tolerability and adverse events.

A plethora of literature has shown the increased incidence of adverse events associated with opioid analgesics in comparison with NSAIDs. While increased effectiveness in pain control can lead to decreased length of stay in post-operative patients, both opioids and non-opioid analgesics have been shown to be equally effective in pain control. Thus the main cause of difference is down to the other factors including the adverse events and such.^{16, 17, 19}

V. Conclusion

The length of hospital stay in a post-operative patient is directly dependent on the ASA grade of the patient. Higher the grade more are the number of days required for the patient to be fully discharged. Patients administered opioid analgesic for post-operative pain relief had slightly higher length of hospitalization than those administered diclofenac. The factors affecting the relation between analgesic and length of stay in this study need to be further evaluated.

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