

NSAIDs Preferred Over Opioid as Post-Operative Analgesic: A Prospective, Observational Prescribing Pattern Study in a Tertiary Care Hospital of Eastern India

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Received: July 2019

Accepted: July 2019

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ABSTRACT

Background: Pain is an unpleasant sensation as a consequence of injury, disease along with emotional disorder occurring in varying degrees of severity. Poor control of pain is complete unethical, clinically unsound and economically disastrous. Effective pain control in postoperative period is one of the essential components of post-operative care for those patients who have undergone surgery. Inadequate and inappropriate pain control results in significant increase in post-operative morbidity or mortality. **Methods:** An prospective, observational analytical study by collection of data without intervention was done. Ethical committee's approval was duly taken. Data were collected in the post-operative ward of department of general surgery from the bed side tickets of the patients. **Results:** In our current study we observed out of 515 postoperative patients 49.5% (255) were male and 50.5 % (260) were female, on the other hand more Hindu(85.4%) than Muslim(14.6%). On the day of surgery Monotherapy was prescribed for 440(67%) patients and 33% received both combination analgesic therapies. A total of 33% patients who received dual analgesic therapy immediate post-operative period most commonly used combination was Tramadol+Diclofenac (130/170), followed by Tramadol+ Paracetamol (40/170). In the following post-operative days increase in use of Diclofenac+Paracetamol was noted. No Triple drug therapy observed in this study. **Conclusion:** The results of current study shows that diclofenac was the most commonly prescribed analgesic. It is due to high efficacy of diclofenac in post operative pain control with better safty profile; i.e. lesser side effects compared to other analgesic.

Keywords: Analgesic, Cost effectiveness, Diclofenac, Generic prescription, NSAIDs, Opioid, Post-operative.

INTRODUCTION

Pain is an unpleasant sensation as a consequence of injury, disease along with emotional disorder occurring in varying degrees of severity.^[1] Poor control of pain is complete unethical, clinically unsound and economically disastrous.^[2] Recent trend to including pain as fifth vital sign in the health care specially post-operative cases. It has been now emphasised that pain assessment is equally important to that of recording of temperature, pulse, blood pressure, and respiratory rate. "Pain is always subjective".^[3,4]

It has been seen that acute painful disorders are mostly treated instantly and adequately. On the other hand severe visceral pain and severe post-operative pain are mostly under diagnosed and under treated. Successful postoperative pain control can be

achieved by rational use of analgesic with the help of health resources and patient's satisfactions.^[5]

Effective pain control in postoperative period is one of the essential components of post-operative care for those patients who have undergone surgery. Inadequate and inappropriate pain control results in significant increase in post-operative morbidity or mortality. There has been evidence to suggests that surgery suppresses the human immune system and the immune suppression is proportionate to invasiveness of the surgery.^[6,7] Adequate and appropriate analgesia helps to reduce the immune suppression effect. Adequate and effective pain control in postoperative period helps in patient comfort and satisfaction, early mobilization, fast recovery with less chance of the developing neuropathic pain, less chance of developing deep vein thrombosis and overall and above reduced cost of care. The cause of failure to provide adequate postoperative analgesia is multiple. Poor pain assessment, inadequate education, irrational fear of adverse event of analgesic drugs and insufficient adequately trained staff are among its causes. Analgesics are the drugs which relieve pain without

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altering sensory function or blocking nerve impulse conduction.^[8] Analgesic can be classified into two depending on the mechanism of pain relieving action. Opioids inhibit pain impulses by acting centrally in brain receptors. Opioids commonly used for short or long-term relief of sever visceral pain, like myocardial infraction. Most of the opioid analgesic has some anxiolytic and sedative effect. It can be bought by prescription as it bears a high risk of drug addiction. Non opioids, commonly non steroidal anti-inflammatory analgesic commonly used for short term relief of somatic- skeletal modest pain can be accessible without prescription. NSAIDs act by inhibiting synthesis of prostaglandins which is the commonly involved molecules in peripheral perception of somatic pain.

Different patient responded differently after administration of analgesics. A particular analgesic in a specific dose produces successful pain relief for one patient may produce unbearable adverse effects with insufficient pain control in another person. Irrational prescription of analgesic is a very common incidence in todays practice. The study of prescribing pattern is one of the most important constituent of prescription audit. Prescription audit helps to monitor, evaluate and helps in modify the prescribing pattern to attain a rational as well as cost effective medical care. Auditing of prescriptions is the most important part of studies on drug utilization. Drug utilization studies evaluates appropriateness of drug prescribing in comparing with slandered treatment guideline . The intention of drug utilization studies is to evaluate those current patterns of prescribing, dispensing and the use of drug are comparable with criteria and standards. These criteria and standards must demonstrate that drug therapy is appropriate, safe, effective, and cost effective and help in optimal patient outcome.^[9] The final goal of this research is to evaluate the prescribing pattern of analgesics in postoperative pain management in a tertiary care hospital of eastern india.

Aim and Objectives

- To assess commonly prescribed analgesics for postoperative pain relief.
- To evaluate prescribing pattern of non-opioid in compare to opioid analgesic

MATERIALS AND METHODS

Study Design:

Observational study by collection of data without intervention.

Type of Study:

Prospective analytical study.

Study Site: IQ City Medical College, Durgapur, Department of General Surgery & Pharmacology, West Bengal.

Duration of Study: April 2018 to April 2019

Number of Subjects: 515 cases

Ethical committee Approval: The ethical committee approval was taken from the Ethical Committee, IQ City Medical College, Durgapur, West Bengal.

Inclusion Criteria:

- Post operative Patients admitted in the department of general surgery.
- Both male and female patients in the age group of 20 – 75 years are included in the study.

Exclusion Criteria:

- Patients dose not undergo surgery.
 - Patients having day care surgery
- The Data Collection method:
1. Patient admitted in the department of general surgery were included in the study based on the inclusion/exclusion criteria.
 2. Bed head ticket (BHT) of the hospital record (case record forms [CRFs]) were randomly collected. The relevant information was entered into the pretested preformats (containing name, age, sex, diagnosis, ongoing treatment as recorded from patients’ prescription slips or CRFs) and analyzed. Analysis done by the help of SPSS and Microsoft Excels 2010

RESULTS

In our current study we observed out of 515 postoperative patients 49.5% (255) were male and 50.5% (260) were female, on the other hand more Hindu (85.4%) than Muslim (14.6%). [Table 1] Most common cause for undergoing operation was cholelithiasis followed by appendicitis and hernia. [Figure 2] On the day of surgery Monotherapy was prescribed for 440(67%) patients and 33% received both combination analgesic therapy [Figure 2].

Table 1: Demographic distribution of the patient

Age	Yrs
Mean	44.56
Range	12 - 75
Gender	No
Male	255
Female	260
Body wt	Kg
Mean	62.26
Range	27-80
Religion	No
Hindu	440
Muslim	75

A total of 33% patients who received dual analgesic therapy immediate post-operative period [Table 2] most commonly used combination was Tramadol+Diclofenac (130/170), followed by Tramadol+ Paracetamol (40/170). In the following post-operative days increase in use of

Diclofenac+Paracetamol was noted. No Triple drug therapy observed in this study. [Table 2]
Average hospital stay according to current study was 4.46 day. [Table 4]

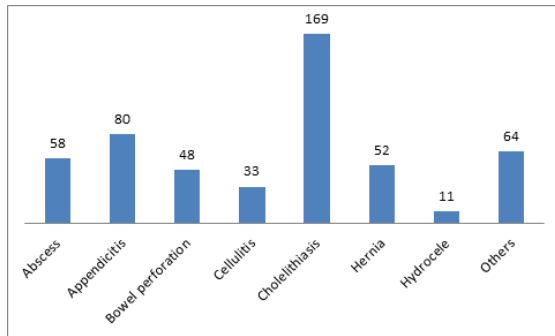


Figure 1: Distribution of disease in surgery inpatient

Table 2: Distribution of analgesic use in immediate post-operative period

Analgesic	No
Inj. Diclofenac Aqua	180
Inj. Diclofenac Aqua + Inj. Tramadol	130
Inj. Paracetamol	140
Inj. Tramadol +Inj. Paracetamol	40
Inj. Tramadol	5
Suppository Diclofenac	20

Table 3: Distribution of analgesic use in discharge

Analgesic	No
T. Aceclofenac	225
T. Paracetamol	55
T. Tramadol + Paracetamol	230
T. Tramadol	5

Table 4: Distribution of duration of hospital stay

Hospital stay	No of days
Mean	4.46
Range	01-10 days

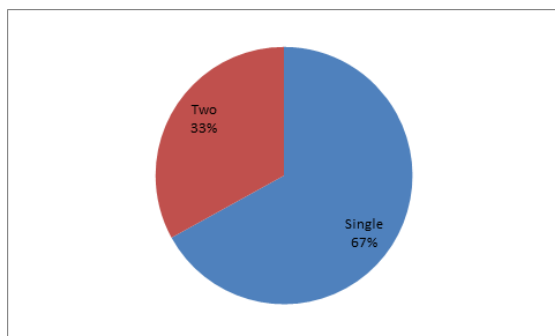


Figure 2: Distribution of analgesic therapy

DISCUSSION

The current study reveals that Diclofenac was most commonly prescribe analgesic in the day of operation. Possible explanation of use of Diclofenac is it's high efficacy in post-operative pain relief with very good safety profile. Pain contents of both sensory as well as affective components. Opioid analgesics are unique as they can reduce both the

aspects of the pain. Steroidal and non-steroidal analgesic (NSAIDs) drugs does not have any significant effect on the emotional aspects of pain. These analgesics are more effective in relieving inflammation, more specifically those pain associated with sensory component primarily by inhibiting synthesis of proinflammatory sensitizers like prostaglandin,^[10] NFkB,cytokines etc. The pharmacokinetics and pharmacodynamics features of analgesics can be altered by different complex impact like cognition in older age group patients who may undergo different types of surgeries to improved life span.^[11,12] It has been commonly observe that, elderly subjects are much more sensitive to opioid analgesic than younger even in therapeutic doses. The patho-physiology of pain processing changes with increasing age.

In older patients it has been seen, suprathreshold pain responses are difficult to modulate respond to nociceptive stimulus.^[12] So selection of analgesic to be done with outmost care. The adequate and appropriate control of pain helps to reduce incidence of postoperative complications.^[13] The current study shows that Diclofenac was the most commonly used NSAIDs analgesic by parenteral route followed by Paracetamol. Current study also shows that, Diclofenac has been used both as monotherapy and in combination with other analgesic drugs. As Diclofenac is a nonselective inhibitor of cyclooxygenase enzyme, it is effective in relieving moderate and severe pain induced by inflammation.^[13] The most important advantage of using diclofenac for post-operative pain is that it can easily administered parenterally in initial post-operative period which can comfortably converted to enteral route later when patient can take orally on 2nd and 3rd post-operative day.

Paracetamol have more antipyretic effect than its' analgesic effect. It can be explained by its' selective COX-3 inhibition. Nonopioid analgesic drugs have been shown to produce much lesser side effects both in severity and incidence than commonly therapeutically used opioid drugs.^[14] Usage of Non-opioids in adequet dose and duration helps in decrease requirement of use opioid analgesic,more specifically in the early post-operative period.^[13,4] Findings in the current study shows preferrancial use of non-opioid analgesics to management of postoperative pain relief are comparable with the studies done by Dashputra AVet al,Chaudhari J Set al and Vallano A et al suggesting that,^[13,15,16] Opioid analogues tramadol was prescribed as monotherapy as well as in combination with NSAIDs [Table 2] during perioperative period of surgery with good pain control by surgical departments. But use of analgesics has reduced in frequency and from parenteral route to oral 1st to 3rd Post-operative day. Use of NSAIDs more than opioid can explained by, reduce chances of addiction and as most of the post-operative pain due to inflammation with very

less involvement of visceral and affective component of the pain persist compared to the day of surgery when anxiety enhance pain sensation in most of the cases. On the other hand use of NSAIDs remained almost similar throughout the period of observation. Difference commonly observed in change of route of administration from parenteral on immediate post-operative period to oral on the 3rd day showing effective pain control by drugs in different routes.

Prescribing in generic name helps in rational prescribing of drugs with optimal value to cost of pharmacotherapy, safety and also efficacy by optimization the identification of the specific pharmacotherapeutic products by its nonproprietary names, we tried to analyze this parameter also in our current study. But in current study we found that compared to the generic name in 42%, brand name has been prescribed in 58% of the analgesic prescriptions which was similar to the findings observed by Tabish A et al (84.08%) and Bhansali NB et al (51.43%),^[1,17] In more than 90% of prescriptions additional drugs has been prescribed to prevent the adverse effects of consumed analgesics, specifically in cases of NSAIDs. Among them, 28.5% of this prescriptions contains H2 blockers and 71.5% of prescriptions contains proton pump inhibitors (PPI) as a additional drugs to prevent adverse drug effects of NSAIDs analgesics. Proton pump inhibitors were the most commonly drugs used to prevent NSAIDs induced adverse effects, more specifically acid-peptic disorder in the hospital. The study of Rahman,^[18] et al also founded that proton pump inhibitors were the commonly used drugs that prevent NSAIDs induce specific adverse effects in the hospital at Dhaka shows similarity to our study. The study of Lapne KL et al,^[19] indicates that the analgesic dose of most of the NSAIDs was associated with a significant increase in acid-peptic disorder associated risk of Gastro intestinal bleeding.

One of the previous study shows that the Diclofenac has a longer duration of action than opioid when we consider pain intensity and visual analogue scales. It also found that the rate of respiration in the opioid group were significantly more depressed after the injection than in the NSAID group OF analgesic. NSAIDs caused comparative less depression in both systolic and diastolic blood pressure after both 30 and 60 minutes of analgesic administration.^[20] Another study proposed that NSAIDs is a suitable alternative to opioids. Studies also reported nausea and vomiting of delayed onset as a disadvantage of NSAIDs.^[21]

CONCLUSION

Pain is one of the most commonly experienced symptom among all type of post-operative patients, it may alter in different studies and it depends upon

the characteristic of the selected patients. Current study also shows that, antiulcer drugs were commonly prescribed along with the NSAID analgesics to reduce one of the common and important adverse effect of NSAID'S that is acid-peptic disorder complications. The analgesic use was optimal and single analgesic was used in maximum number of post-operative cases. Surgeons commonly preferred non-opioid analgesic because of their less adverse effects. The results of current study show that diclofenac was the most commonly prescribed analgesic. It is due to high efficacy of diclofenac in post-operative pain control with better safety profile; i.e. lesser side effects compared to other analgesic. In order to reduce the cost of therapy, the prescription of analgesic in Generic name plays an important role in rational prescribing of analgesic (helps in appropriate dispensing of drugs, Cost, safety and efficacy) compare to prescription brand. Generic prescription also helps in reduce the cost of analgesic therapy. The use of number, group and dose of analgesics primarily depends upon the severity of pain. In mild pain, single analgesics preferably non-opioid in low therapeutic dose are commonly used where as two or more analgesics, preferably one of it opioid in nature in high therapeutic dose are used in moderate and severe pain.

REFERENCES

1. Tabish A, Jha RK, Rathod AM et al. RJPBCS, Jul – Sep 2012;3:566-71.
2. Bertolini G, Minelli C, Latronico N, Cattaneo A. Eur J Clin Pharmacol (2002) 58:73–77.
3. Mohammed TCH, Beegum IM, Perumal P. Int.J. PharmTech Res.2011,3(3):1521-29.
4. Elvir-Lazo OF, White PF. Curr Opin Anesthesiol 2010,23:697–703.
5. Swamy RM, Venkatesh G, Nagaraj HK. Biomedical Research 2010; 21 (4): 401-405.
6. Award AI, Himad HA. Drug-use practices in the teaching hospitals of Khartoum State, Sudan. Eur J Clin Pharmacol. 2006;62:1087–93. [PubMed: 17091270]
7. De Vries TP, Henning RH, Hogerzeil HV, Bapna JS, Bero L, Kafle KK, et al. Impact of a short course in pharmacotherapy for undergraduate medical students: An international randomised controlled study. Lancet. 1995;346:1454–7. [PubMed: 7490991]
8. Patel V, Vaidya R, Naik D, Borker P. Irrational drug use in India: A prescription survey from Goa. J Postgrad Med. 2005;51:9–12. [PubMed: 15793331]
9. Dutta A, Chakraborty S. Practice of rational drug uses in a rural area of 24 pgs(s) in West Bengal. J Adv Pharm Technol Res. 2010;1:358–64. [PMCID: PMC3255423] [PubMed: 22247872]
10. DeshpandeS, Naik N. Der Pharmacia Lettre 2012, 4(4):1188-93.
11. Sun X, Quinn T, Weissman C. Chest 1992; 101:1625-32.
12. McLachlan AJ, Bath S, Naganathan V, Hilmer SN. Br J Clin Pharmacol 2011; 71(3):351–364.
13. Dashputra AV, Badwaik RT. Int J Med Pharm Sci, Feb 2013,3(6):14-19.
14. Ehikhamenor EE, Aghahowa SE, Azodo CC. JMBR June 2012,11(1):71-77.

15. Chaudhari JS, Kubavat AR, Mistry VR, Pandya AS, Hotchandani SC, Patel BS. *Int J Basic Clin Pharmacol* 2013;2:757-62.
16. Vallano A, Aguilera C, Arnau JM et al. *Br J Clin Pharmacol*, 1999; 47:667–673.
17. Bhansali NB, Gosai TR, Dholaria NK, Suthar SD et al. *Der Pharmacia Lettre*, 2013, 5 (1):251-257.
18. National informatics centre Adilabad, Official website of Adilabad collectorate.mht. [Last accessed on 2011 Sept 20]. Available from: <http://www.adilabad.ap.gov.in> .
19. Kumari R, Idris MZ, Bhushan V , Khanna A, Agrawal M, Singh SK. Assessment of prescription pattern at the public health facilities of Lucknow district. *Indian J Pharmacol*. 2008;40:243–7. [PMCID: PMC3025139] [PubMed: 21279178]
20. Yasin B, Asghar M. Nalbuphine compared to Pethidine for postoperative pain relief after Orthopaedic surgery. *Anesth Pain Intens Care*.2005; 9: 3-6.
21. Chestnutt WN, Clarke RSJ, Dundee JW. Comparison of Nalbuphine, Pethidine and Placebo as Premedication For Minor Gynaecological Surgery. *Br J Anaes*.1987; 59: 576580.

How to cite this article: Ghosh S, Gupta SK. NSAIDs Preferred Over Opioid as Post-Operative Analgesic: A Prospective, Observational Prescribing Pattern Study in a Tertiary Care Hospital of Eastern India. *Ann. Int. Med. Den. Res.* 2019; 5(5):PC12-PC16.

Source of Support: Nil, **Conflict of Interest:** None declared