Drug utilization pattern of analgesics among postoperative patients in a tertiary care hospital

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ABSTRACT

Post-operative patients require analgesics. As large varieties of analgesics are available, irrational prescription is possible at times which can lead to unwanted side effects. Hence this study has been designed to evaluate the drug utilization pattern of analgesics among post-operative patients in a tertiary care teaching hospital, Pondicherry. A prospective observational cross-sectional study was conducted for a period of 2 months up to 3rd post-operative day and data was collected from the case sheets after getting approval from Institutional Research and Ethics committee and analysed by descriptive statistics. We observed 56 postoperative patients of which 45%(25) were male and 55%(31) were female. Of these 39%(22), 36%(20) and 25%(14) were from General surgery, Obstetrics & gynaecology and Orthopaedic departments respectively. On the day of surgery Monotherapy was prescribed for 30(53%) patients of which Diclofenac(60%) was the most commonly prescribed drug followed by Tramodal(37%) and Pentazocin(3%). Out of 45% patients combination of tramodal and diclofenac (56%) was commonly observed, followed by Diclofenac and Pentazocin(24%) and Tramodal with Pentazocin(20%). Three drug therapy of Diclofenac, tramadol and pentazocin was prescribed only in 2% of cases. Intra muscular administration was the most preferred route. This study has suggested that postoperative pain control was able to be achieved by non-opioid drug Diclofenac itself and opioid analogues have been added to patients for whom pain relief could not be achieved. Utilization of analgesics was found to be based on the type of surgery and the physician’s preference.

Keywords: Analgesics, utilization study, post-operative pain

INTRODUCTION

The world health organization (WHO) in 1977 has defined drug utilization as the marketing, distribution, prescription and use of drugs in a society, with special emphasis on the resulting medical, social and economic consequences [1,2].

Pain is an unpleasant sensation occurring in varying degrees of severity as a consequence of injury, disease, or emotional disorder [3]. Poor pain control is unethical, clinically unsound and economically wasteful [4]. The recent initiative of including pain as fifth vital sign in health care has emphasized pain assessment is equally important to that of temperature, pulse, blood pressure, and respiratory rate recording. “Pain is always subjective” [5,6].
Acute painful disorders are treated instantly; on the other hand severe post-operative pain and severe visceral pain are under diagnosed and under treated. Successful postoperative pain control was achieved by efficient use of health resources and patient’s satisfactions [7].

Analgesics are defined as the drugs that relieve pain without blocking nerve impulse conduction or markedly altering sensory function [5]. A particular analgesic dose that produces successful pain relief in one patient may generate bearable adverse effects and insufficient pain control in another person. Large varieties of analgesics are available in the market which may lead to the problem of irrational prescription [8]. Hence this study was designed to evaluate the drug utilization pattern of analgesics among postoperative wards in a tertiary care teaching hospital.

AIM AND OBJECTIVES

- To assess the most commonly prescribed analgesics for postoperative pain relief.
- To evaluate the most preferred analgesic pattern.

MATERIALS AND METHODS

This observational cross sectional study was conducted from August 2013 to September 2013 at SVMCH & RC, Pondicherry; a tertiary care teaching hospital of south India after obtaining the approval of Institutional research and ethics committee. The patients who underwent major operative procedure in the age group of 18 to 60 years were recruited in this study from varies surgical departments irrespective of the type of surgery. Departments included in the study were general surgery, orthopaedics and obstetrics & gynaecology (OBG).

Information on age and sex of the patients and analgesics used were recorded from the day of surgery up to 3rd post-operative day from the case sheets, by using standard data collection form after obtaining Informed consent.

Statistical Analysis:

Data were analyzed using descriptive statistics and the results were presented by using frequency distribution table with Microsoft excel and Graph pad Prism software (version 6.0.3.0).

RESULTS

We observed out of 56 postoperative patients 45% (25) were male and 55% (31) were female and 23 (41.1%) patients were in the age group of 31-45 years and 16 (28.6%) were in 46-65 years age group (figure 1). Of these 39% (22), 36% (20) and 25% (14) were from General Surgery, Obstetrics & gynaecology and Orthopaedic departments respectively (figure 2).

On the day of surgery Monotherapy was prescribed for 30(53.6%) patients and 46.3% received both opioid and non-opioid combination therapy (figure 3). On first, second and third post-operative days monotherapy usage was increased up to 94.6 percentages. Diclofenac (60%) was the most commonly prescribed drug as monotherapy followed by Tramadol (37%) and Pentazocin (24%) as seen in figure 4. Monotherapy usage of Diclofenac was seen more in orthopedics and General surgery departments while Tramadol was the drug of choice in OB&G department (figure 5).

A total of 44.6% patients who received dual drug therapy (table 1) most commonly used combination was Tramadol + Diclofenac (56%), followed by Tramadol + Pentazocin (24%) and Diclofenac + Pentazocin (24%). In the following post-operative days increase in use of Diclofenac + Paracetamol was noted. Triple drug therapy with combination of Diclofenac, Tramadol and Pentazocin was prescribed in 2% patients of total population.
The route of administration was intramuscular followed by oral and intravenous very rarely. Only 39% of drugs were prescribed by generic name, whereas brand name was found to be used while prescribing 61% of drugs (figure 6). Percentage of drugs prescribed from essential drug list of India was 75% [9]. The total cost of analgesics incurred for post-operative pain was found to be 131.88 INR per subject.

**Figure 1. Age distribution**

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-30 yrs</td>
<td>17</td>
<td>30.4%</td>
</tr>
<tr>
<td>31-45 yrs</td>
<td>22</td>
<td>41.1%</td>
</tr>
<tr>
<td>46-65 yrs</td>
<td>16</td>
<td>28.6%</td>
</tr>
</tbody>
</table>

**Figure 2. Department wise distribution**

- OBG: 25%
- General surgery: 39%
- Ortho: 36%
Figure 3. Pattern of Analgesic prescription in post-operative period

On the day of surgery

1st POD

2nd POD

3rd POD

Figure 4. Percentage of analgesics use in the post-operative periods

On the day of surgery

1st POD

2nd POD

3rd POD

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On the day of surgery

Figure 5. Choice of Monotherapy Department wise.

1-Diclofenac sodium, 2-Tramadol, 3-Pentazocin.

Table 1. Analgesic pattern of Two drug therapy

<table>
<thead>
<tr>
<th>Days of surgery</th>
<th>Tramadol+ Diclofenac</th>
<th>Tramadol+ Pentazocin</th>
<th>Diclofenac+ Pentazocin</th>
<th>Diclofenac + Paracetamol</th>
</tr>
</thead>
<tbody>
<tr>
<td>On day</td>
<td>56.0%</td>
<td>24.0%</td>
<td>20.0%</td>
<td>-</td>
</tr>
<tr>
<td>1st POD</td>
<td>53.8%</td>
<td>7.7%</td>
<td>30.8%</td>
<td>7.7%</td>
</tr>
<tr>
<td>2nd POD</td>
<td>57.1%</td>
<td>28.6%</td>
<td>-</td>
<td>14.3%</td>
</tr>
<tr>
<td>3rd POD</td>
<td>33.3%</td>
<td>33.3%</td>
<td>-</td>
<td>33.3%</td>
</tr>
</tbody>
</table>

Figure 6. Prescription pattern

<table>
<thead>
<tr>
<th>Brand Name</th>
<th>Generic Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>39%</td>
<td>61%</td>
</tr>
</tbody>
</table>

DISCUSSION

Pain consists of both sensory and affective (emotional) components. Opioid analgesics are unique in that they can reduce both the aspects of the pain experience, especially the affective component [10]. In contrast, non-opioid
Steroidal and non-steroidal analgesic drugs have no significant effect on the emotional aspects of pain and will be more effective in relieving inflammation associated sensory component by inhibiting the synthesis of pro-inflammatory sensitizers like prostaglandins, NFkB, cytokines etc. The pharmacodynamics and pharmacokinetics features of analgesics can be affected by the impact of complexities like frailty and cognition in older age group patients who may undergo surgeries due to improved life span. The elderly subjects are more sensitive to therapeutice doses of opioids than younger. Because age-related changes in pain processing occur in older patients, including suprathreshold pain responses may make it difficult to modulate respond to nociceptive input. So selection of analgesic should be done carefully.

The present study shows that Diclofenac was the most frequently used non-opioid analgesic by intramuscular route followed by Paracetamol. Diclofenac has been chosen both as mono and in combination with other drugs. As it is a nonselective COX inhibitor it will be effective in relieving inflammation induced moderate and severe pain. The advantage of diclofenac usage for post-operative pain is that it can be administered parenteral in initial post-operative period which can be converted to enteral route later on 2nd and 3rd post-operative day.

But being a selective COX-3 inhibitor, Paracetamol is said to have more antipyretic effect than analgesic effect. Non-opioid drugs have been shown to produce lesser side effects than opioid drugs. Usage of Non-opioids can decrease the requirement of opioid usage in the early post-operative period. Findings in this study are comparable with Dashputra AV et al, Chaudhari JS et al and Vallano A et al suggesting that, non-opioid analgesics are the preferred drugs for the treatment of postoperative pain relief. The variation in the preference of analgesics either as mono or in combination among different departments could not be well explained.

Opioid analogues like tramadol, pentazocin were prescribed as monotherapy 37% & 3% respectively only on the day of surgery with good pain control by all the studied departments. But its use has reduced from 1st Post-operative day to 3rd Post-operative day, probably to prevent addiction or as post-operative pain will be mostly due to inflammation with less involvement of affective component compared to the day of surgery when anxiety also might be more enhancing pain sensation. Whereas Diclofenac Sodium’s use remained almost the same throughout the observed period which reduced from 63% on the day of surgery to only 57% on the 3rd day showing its effective pain control.

As prescribing by generic name will help for rational use of drugs with regard to cost, safety and efficacy by permitting the identification of the products by its scientific names, we wanted to analyze this parameter also. But we found that compared to the generic name in 39%, brand name has been used in 61% of the analgesic prescriptions in our study similar to the findings observed by Tabish A et al (84.08%) and Bhansali NB et al (51.43%).

CONCLUSION

This study has suggested that postoperative pain control was able to be achieved by non-opioid drugs like Diclofenac monotherapy itself which is cheap with less ADR. Opioid analogues have been added to patients for whom pain relief could not be achieved with diclofenac alone. Utilization of analgesics was found to be based on the type of surgery and the physician’s preference. It is suggested that the choice of analgesic should also be based on age of the patients. With proper and safe use of analgesics it will be possible to achieve good and effective pain control in post-operative patients. Creating awareness by continuing medical education programs regarding RATIONAL USE OF DRUGS, and routine auditing of prescriptions will be helpful for the improvement of proper use of drugs which in turn can provide good quality health care economically. This utilization study is intended to be an initial step in the broader evaluation of analgesic drug prescriptions in teaching hospitals.

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REFERENCES