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Drug usage pattern of analgesics among intraoperative patients in a tertiary care hospital

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ABSTRACT

Inadequately treated surgical pain is a major clinical, social and economic concern throughout the world. The prospective observational study on drug usage pattern of analgesics among intraoperative patients was carried over a period of six months, on 150 consecutive inpatients of Anaesthesia department in a tertiary care hospital in Tamil Nadu. From the 100 cases included in the study, it was found that 25% of the cases were posted for hernioplasty. Majority of cases required a single anaesthetic agent (83%). Fentanyl was the most commonly used intraoperative analgesic agent (75%), but a combination of bupivacaine and fentanyl (37%) provided a superior quality of analgesia with a lesser need of additional analgesics. 84% of the subjects experienced no ADRs. Our study showed variations in the selection of intraoperative analgesics by different consultant anesthesiologists for patients undergoing various surgical procedures. As there are no study reports available in our country on intraoperative analgesic use for major and invasive surgeries, this study will serve to provide a data regarding the utilization pattern of intraoperative analgesics in this part of India.



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INTRODUCTION

With the rapid innovations in anaesthetic techniques, surgical interventions have become the backbone of modern medical science (Ahmed A *et al.*, 2007). In the majority of all surgical procedures, pain is thought to be inadequately treated (Carr DB *et al.*, 1992). Despite being unpleasant, pain can imprint permanently on the nervous system, thereby amplifying the response to subsequent painful stimuli causing typically painless sensations to be

experienced as pain. A chronic condition sometimes develops that produces continuous pain long after surgery (Bachiooco V *et al.*, 1993, Taenzer P *et al.*, 1986). Intraoperative analgesia is an evolving concept that focuses on introducing adequate analgesic regimen before the actual onset of painful stimuli, in order to prevent sensitization of the nervous system to subsequent stimuli that could amplify pain (Dahl J *et al.*, 2004). The purpose of intraoperative analgesia is to reduce post-operative pain, contributing to a more comfortable recovery period and reducing the need for narcotic pain control, reducing the amount of drug needed, decrease the time needed to recover from the drug-induced CNS depression (Kaufman E *et al.*, 2005). Despite the significant role played by intraoperative analgesics in reducing anaesthetic dose and thereby side effects like respiratory depression, hypotension etc. and thereby contributing to the success rate and early recovery of patients following surgery; very few or almost no study has been so far

Table 1: Posting for surgery from various departments

S. No.	Department	No of patients	Percentage
1.	General Surgery	49	49%
2.	Obstetrics and gynecology	24	24%
3.	Orthopaedics	17	17%
4.	ER	4	4%
5.	Paediatric surgery	3	3%
6.	ENT	2	2%
7.	Pedodontics and preventive dentistry	1	1%
	Total	100	100%

Table 2: Types of anaesthetics given intraoperatively

S. No.	Anaesthesia	No of patients	Percentage
1.	Single anaesthesia	83	83%
2.	Combination anaesthesia	17	17%
	Total	100	100%

Table 3: Types of anaesthetic agents used intraoperatively

S. No.	Type of anaesthesia	No of patients	Percentage
1.	General anaesthesia	30	30%
2.	Spinal anaesthesia	53	53%
3.	General + Spinal anaesthesia	4	4%
4.	General + Epidural anaesthesia	2	2%
5.	Spinal + Epidural anaesthesia	11	11%
	Total	100	100%

carried out to analyze the drug usage pattern of intraoperative analgesics in major or significantly invasive surgical procedures in our country. Keeping this into account, the present study has been designed to analyze the drug utilization pattern of analgesics in intraoperative patients with the following objectives.

- To find out the usage pattern of different types of analgesics during surgical procedures.
- To categorize intraoperative analgesics based on the frequency of dosing, mode of administration and side effects.

MATERIALS AND METHODS

The prospective observational study on drug usage pattern of analgesics among intraoperative patients was carried out in the anaesthesia department of a tertiary care hospital in Salem, Tamil Nadu for 6 months from November 2016-April 2017 on 150 consecutive inpatients of anaesthesia department. Patients posted for various types of surgical procedures from different departments like general surgery, orthopaedics, obstetrics and gynaecology, pediatric surgery etc. were included in the study except those posted for short surgical procedures without the need of analgesics and patients allergic to a particular analgesic.

RESULTS AND DISCUSSION

All the results of this study are interconnected and one leads to and supports another.

Age wise distribution of cases has enabled us in determining the pattern of intraoperative analgesic use among the various age groups. Majority of the study participants belonged to the age group 21-30. Our study result was in accordance with the study carried out by Saha *et al.*, 2016, in whose study 68.3% of intraoperative patients belonged to the age group 18-30 years.

Our observation that majority of the study subjects were given single anaesthetic agent and combination analgesic agents; in fact, reflected the importance of adequate intraoperative analgesia in reducing the dose and usage of more toxic anaesthetics intraoperatively. Hernioplasty was the most frequently performed surgery during the study period. This finding was consistent with the findings of Ali S A *et al.*, 2010, where it was 33.47%. However, Bhatti G *et al.*, 2006, reported that an appendectomy was the most common surgery in their audit. These variations depend on different hospital and they may not be consistent for months. This observation also supports the finding that spinal anaesthesia was preferred for the majority of the cases, owing to its advantage in enhancing surgeries below the level of the umbilicus (e.g., hernioplasty). Spinal anaesthesia is also preferred owing to its many advantages like reduced respiratory depression etc (Al-Nashi *et al.*, 2013).

Our observation was supported by Algert *et al.*, 2009, who through his study recommended regional anaesthesia over general anaesthesia for

Table 4: Different classes of analgesics utilized intraoperatively

S. No.	Analgesics given	No of patients	Percentage
1.	Single analgesic	27	27%
2.	Combined analgesics	73	73%
	Total	100	100%

Table 5: Analgesic combinations utilized intraoperatively

S.No.	Combination of analgesics used	No of patients	Percentage
1.	Fentanyl + Ketamine + Nitrous oxide	2	2.739%
2.	Fentanyl+Bupivacaine+Pentazocine	1	1.369%
3.	Fentanyl+Bupivacaine+Pethidine	1	1.369%
4.	Fentanyl+Ketamine	1	1.369%
5.	Bupivacaine+Lignocaine	1	1.369%
6.	Pethidine+Nitrous oxide	1	1.369%
7.	Pethidine+fentanyl+Bupivacaine+Nitrous oxide	1	1.369%
8.	Pentazocine+Tramadol+Bupivacaine	1	1.369%
9.	Pethidine+Lignocaine+Bupivacaine	2	2.739%
10.	Fentanyl+Bupivacaine+Lignocaine	3	4.109%
11.	Fentanyl+Bupivacaine+Nitrous oxide	1	1.369%
12.	Fentanyl+Nitrous oxide+Diclofenac	1	1.369%
13.	Fentanyl+Ketamine+Bupivacaine+Nitrous oxide	1	1.369%
14.	Fentanyl+Bupivacaine+Lignocaine+Nitrous oxide	1	1.369%
15.	Fentanyl+Nitrous oxide	17	23.287%
16.	Fentanyl+Bupivacaine	37	50.684%
17.	Ketorolac+Fentanyl+Bupivacaine+Lignocaine	1	1.369%
	Total	73	100%

Table 6: Frequency of usage of analgesics intraoperatively

S. No.	Frequency of analgesic use	No of patients	Percentage
1.	Once	90	90%
2.	Twice	8	8%
3.	Thrice	2	2%
	Total	100	100%

caesarean sections owing to its lesser relative risks.

Our study results showed that in the majority of the patients, only a single administration of intraoperative analgesia was required. This reflects the accuracy and appropriateness in the selection of intraoperative analgesics (Al-Grawi 2018).

Our study results indicated anaesthetics that possess analgesic effects as the most commonly utilized analgesics among intraoperative patients; this finding was in accordance with the study of Pasha *et al.*, 2012, where the use of 50% nitrous oxide caused less labour pain, favourable expectations and experiences, and also greater maternal satisfaction. Our results were also supported by the study of Mobaraki N *et al.*, 2016, which concluded that inhaled nitrous oxide seems to give better pain relief in the short term compared to a single dose of Pethidine.

Fentanyl + Bupivacaine was the most commonly used analgesic-anaesthetic combination used in obstetrics and gynaecology (45.8%), General Surgery (40.42%), and orthopaedics (35.7%) departments in our hospital setup. Rayees *et al.*, 2016,

showed ropivacaine as the common anaesthetic drug. Many studies favoured ropivacaine as the common anaesthetic utilized in their hospital setup.

CONCLUSION

From the results of our study, it may be concluded that the intraoperative analgesics may vary from country to country and hospital to hospital. Our study showed variations in the selection of intraoperative analgesics by different consultant anaesthesiologists for patients undergoing various surgical procedures. In our study, Fentanyl was the most commonly used analgesic agent (75%), but a combination of bupivacaine and fentanyl (37%) provided a superior quality of analgesia with a lesser need of additional analgesics. This indicates the use of a combination of analgesic modalities as superior to monotherapy, as reflected in our study where the combination of bupivacaine and fentanyl showed better analgesic efficacy.

As there are no study reports available in our country on intraoperative analgesic use for major and invasive surgeries, this study will serve to provide

a data regarding the utilization pattern of intraoperative analgesics in this part of India.

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