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Level of Pain among Postoperative Cardiac Patients: Role of Intravenous Paracetamol and Fentanyl

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Abstract

Background: Pain is the most critical symptom that influences the overall recovery of heart surgery patients, yet it is also the symptom that receives the least amount of attention from medical professionals. Patients undergoing major surgery and critically unwell patients frequently receive paracetamol by intravenous administration. In the treatment of post-operative pain, the valuable analgesic characteristics of fentanyl are considered to be standard, and it has been discovered that routine administration is effective in alleviating pain.

Materials and Method: Patients who had recently undergone cardiac surgery were the subjects of a descriptive exploratory investigation. Every single person who took part in the study knowingly and willingly signed their names on the consent papers. The Postoperative Cardiac unit was where the data collection took place. Data were acquired using a sample that was chosen at convenient intervals. Prior to the intravenous infusion of paracetamol and fentanyl, the patient's level of discomfort as well as their vital signs were evaluated. The level of discomfort and the patient's vital signs were evaluated once more after the administration of paracetamol and fentanyl. Using descriptive statistics, the acquired data were investigated and examined in terms of their characteristics.

Before receiving an infusion of paracetamol, the majority of the samples (50%) exhibited mild pain, while 46.7% exhibited moderate pain. However, after receiving an infusion of paracetamol, the majority of the samples (80%) exhibited mild pain. In the fentanyl group, 60 percent of patients had mild pain, 36.4 percent had moderate pain before the infusion, and 86.6 percent of patients had mild pain after the

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infusion.
The results showed that individuals had a mild to moderate pain level of pain after cardiac surgery, and that intravenous paracetamol and fentanyl were effective in the management of pain among Postoperative Cardiac Patients. Additionally, the results show that vital signs remained stable after the administration of intravenous paracetamol and fentanyl. Conclusions: The results highlighted that individuals had mild to moderate pain level of pain after cardiac surgery, and that intravenous paracetamol and fentanyl

1. Introduction

After any kind of surgical procedure, pain is the number one complaint that patients have, which leads to the administration of opioid rescue analgesics in as many as 80 percent of cases. [1] Pain is the most significant symptom that influences the overall recovery of heart surgery patients, although it is also the one that is controlled the least well. [2] Paracetamol is typically given intravenously to patients who are undergoing major surgery as well as individuals who are critically ill. It is also widely used in hospitals postoperatively following cardiac surgery as a component of postoperative pain management and increased recovery after surgery. [3,4] Within the first five to ten minutes After being administered, paracetamol through an IV immediately begins to alleviate the patient's discomfort. [5] The usage of paracetamol has been shown to be effective in the management of postoperative pain. [6,7]

Opioids such as fentanyl, which are commonly used to relieve the pain that patients experience after surgery, are among the many pain management strategies that have been in use for quite some time. [8] The valuable analgesic characteristics of fentanyl in the treatment of post-operative pain are considered to be standard, and it has been discovered that routine therapy with opioids from the beginning of operation results in much better pain control at the end of surgery. [9,10]

The body's response to pain is altered as a result of fentanyl's interaction with the mu-opioid receptors found in the central nervous system. Certain neurotransmitters, such as beta-endorphins, which are sensitive to pain, are released when fentanyl is taken. Fentanyl provides a number of benefits, including an immediate onset of action, a very brief duration of effect, and cardiac stability. [11] Paracetamol, also known as acetaminophen and N-acetyl-p-aminophenol, is a well-tolerated and safe acetanilide derivative medication that has been shown to be effective at relieving pain. Its clinical effects are very certainly caused by its central action, and intravenous treatment gives a quick and consistent therapeutic plasma concentration. In the year 2002, intravenous administration of paracetamol in the form of a unit-dose tablet that was ready for infusion was first introduced. Since the beginning of the previous year, it has been obtainable in India.

It is common knowledge that opioids, such as fentanyl, possess important analgesic characteristics that can be utilised in the treatment of immediate, intense post-operative pain. It has been discovered that administering opioids as a standard

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treatment at the start of the operation provides much better pain control than administering opioids at the end of the surgical procedure. Medications with opioid-sparing actions, such as nonsteroidal anti-inflammatory drugs (NSAIDs), paracetamol, COX-2 inhibitors, local anaesthetics, steroids, and so on, are frequently used to lessen the opioid-related side effects and speed up the recovery process.

Postoperative pain management should have as its primary objectives the promotion of the patient's subjective sense of comfort, the acceleration of the healing process, and the reduction of the likelihood of complications. [12] The current study was conducted with the intention of determining the level of pain experienced by postoperative cardiac patients, as well as the effectiveness of intravenous administration of paracetamol and fentanyl in the treatment of pain.

2. Methods

Patients who had recently undergone cardiac surgery were the subjects of this study, which was of the descriptive exploratory study. The institutional ethics committee gave their support to the proposed research undertaking. Every single person who took part in the study knowingly and willingly signed their names on the consent papers. The Postoperative Cardiac unit was where the data collection took place. Data were acquired using a sample that was chosen at convenient intervals. During this time period, socio-demographic and clinical data, such as gender, age, place of residence, and length of sickness, were obtained. Prior to the intravenous infusion of paracetamol and fentanyl, the patient's level of discomfort as well as their vital signs were evaluated. The level of discomfort and the patient's vital signs were evaluated once more after the administration of paracetamol and fentanyl. The information that was gathered was evaluated, and descriptive statistics were utilised in the analysis process.

3. Results

Table 1: Frequency and percentage distribution of samples according to their social demographical variables.

Demographic Variables		**Paracetamol Group**		**Fentanyl Group**	
		F	**%**	**F**	**%**
Age	18-28	2	6.60%	1	3.30%
	29-39	2	6.60%	3	10%
	40-59	13	43.30%	13	43.30%
	Above 60	13	43.30%	13	43.30%
Gender	Male	21	70%	21	70%
	Female	9	30%	9	30%
Residence	Urban	21	70%	21	70%

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	Rural	9	30%	9	30%
Duration Of Illness	Less than 1 month	17	56.60%	24	80%
	1-3 months	12	40%	6	20%
	More than 3 months	1	3%	0	0%

4. Description of Sample Characteristics

The information that is shown in table no. 1 reveals that The distribution of the sample by to age suggests that the bulk of those in the paracetamol group are between the ages of 49 and 59, and those who are over 60. In fentanyl, the majority (43.30%) of users were either between the ages of 49 and 59 or older than 60. According to the gender distribution of the sample, around 70 percent of the population in the paracetamol group were male. And women made up 30% of the total. The population growth rate in the fentanyl group is comparable to that of the paracetamol group. The residence distribution of the sample shows that almost 70 percent of the population in the paracetamol group lived in metropolitan regions. And thirty percent of them were from rural areas. The population growth rate in the fentanyl group is comparable to that of the paracetamol group. The duration of illness in the paracetamol group shows that 56.60 percent fall into the category of less than one month, 40 percent fall into the category of one to three months, and the remaining 3.30 percent fall into the category of more than three months. In the fentanyl group, 80 percent are in less than one month, and 20 percent are in one to three months.

Table 2: Level of pain among Postoperative Cardiac Patients

Pain Score	**Category**	**Paracetamol Group**				**Fentanyl Group**			
		Before		**After**		**Before**		**After**	
		F	%	F	%	F	%	F	%
0-3	Mild	15	50%	24	80%	18	60%	26	86.6
4-7	Moderate	14	46.7%	6	20%	11	36.4%	4	13.4
8-10	Severe	1	3.3%	0	0	2	6.6%	0	0

Before receiving an infusion of paracetamol, the majority of the samples (50%) experienced mild pain, while 46.7% experienced moderate pain. However, after receiving an infusion of paracetamol, the majority of the samples (80%) experienced mild pain. The data for these findings are presented in table no. 2. In the fentanyl group, 60 percent of patients had mild pain, 36.4 percent had moderate pain before the infusion, and 86.6 percent of patients had mild pain after the infusion.

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Table 3: Assessment of Vital signs after infusion of Paracetamol and Fentanyl

Vital Signs	Paracetamol Group		Fentanyl Group	
	Mean	SD	Mean	SD
Temperature	98.2	0.96	98.1	0.96
Pulse	81.6	3.60	80.8	1.78
Respiration	21.6	1.99	23.06	1.55
Systolic Bp	126.6	11.5	127.3	8.27
Diastolic Bp	78.3	6.98	77.66	6.78
SPO2	96%	0.01	97	0.02

5. Discussion

Before receiving an infusion of paracetamol, the majority of the samples (50%) had mild pain, while 46.7% of the samples experienced moderate pain. However, after receiving an infusion of paracetamol, the majority of the samples (80%) experienced mild discomfort. In the fentanyl group, 60 percent of patients had mild pain, 36.4 percent had moderate pain before the infusion, and 86.6 percent of patients had mild pain after the infusion. The results of the study showed that administering fentanyl and intravenous paracetamol for pain control in postoperative cardiac patients was successful.

The majority of those in the paracetamol group, 43.30 percent, were between the ages of 49 and 59 or over the age of 60. In fentanyl, the majority (43.30%) of users were either between the ages of 49 and 59 or older than 60. According to the gender distribution of the sample, around 70 percent of the population in the paracetamol group were male. And women made up 30% of the total. The population growth rate in the fentanyl group is comparable to that of the paracetamol group. The residence distribution of the sample shows that almost 70 percent of the population in the paracetamol group lived in metropolitan regions. And thirty percent of them were from rural areas.

According to the findings of a study that was carried out by Mehran Kouchek, the severity of the patients' pain was comparable between the two groups after 24 hours, with a mean of 2.60 and a standard deviation of 1.2; after 48 hours, the mean was 2.40, and the standard deviation was 1.5 in the paracetamol group and the fentanyl group, respectively. According to the findings of a study, neither of the two groups showed any substantial harmful effects. [13]

Another prospective observational study carried out by Esteve-Pérez N demonstrates that patient-controlled analgesia that includes on-demand opioids and multi-modal analgesia is a successful alternative treatment following cardiac surgery. It is possible to provide good control of postoperative pain without raising the risk of side effects while also reducing the amount of rescue analgesia that the nursing staff needs to deliver. [14]

6. Conclusion

The evaluation of postoperative pain in patients who have undergone cardiac surgery is particularly significant for the purposes of modifying pain management and reducing the risk of postoperative

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complications and prolonged surgical recovery. The findings of the study showed that individuals experienced a level of pain that ranged from mild to moderate after cardiac surgery. Intravenous paracetamol and fentanyl were effective in the management of pain among postoperative cardiac patients. The study also demonstrated that vital signs remained stable after the administration of intravenous paracetamol and fentanyl.

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