



Received on 25 March, 2014; received in revised form, 10 February, 2016; accepted, 09 March, 2016; published 01 April, 2016

## PROSPECTIVE OBSERVATIONAL STUDY ON PERI-OPERATIVE USAGE PATTERN OF ANALGESICS

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### Key words:

Analgesic, Perioperative,  
General Anaesthesia, Regional Block

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**ABSTRACT:** The present work reports a prospective observational study to determine perioperative usage pattern of analgesics. Both general and regional anaesthesia and also different analgesics which is most effective to manage post operative pain were used. 120 patients were studied randomly as per criteria. Techniques of anaesthesia, pre, peri & post operative vitals and pain scores were noted in selected time interval. Pain score recorded 0-3 as mild, 4-6 as moderate & 7-10 as severe. Of all the analgesics administered in peri & postoperative period, Fentanyl (F) alone & in combination with diclofenac (D) were used maximum in perioperative period. These two groups were compared. In postoperative GA cases, majority patients received paracetamol (P) and tramadol (T) and in regional blocks, Pethidine (PE) Phenergan (PH) combination & tramadol were used. These groups were compared to evaluate pain perception. Fentanyl alone found to be more effective in maintaining hemodynamic stability. In fentanyl-diclofenac combination, pulse rate and blood pressure were higher than fentanyl alone. Pain scores were significantly higher in GA compared to regional blocks. In GA patients, fentanyl-paracetamol combination decrease pain significantly compared to fentanyl-tramadol combination. But in regional techniques, pethidine, phenergan and tramadol in combination with perioperative fentanyl shows same result for decreasing pain. Fentanyl is a better analgesics compared to fentanyl+diclofenac combination in perioperative period and in case of postoperative period paracetamol is better effective compared to tramadol HCL in combination with fentanyl.

**INTRODUCTION:** International Association for the Study of Pain defines Pain as an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage<sup>1</sup>. Post operative pain is most common symptoms in patients. Often it can be severe, unnecessary and increases agony of the patient.

Effective management of post-operative pain is very important. Because Pain usually prolongs hospital stay as it can affect all organs including: respiratory (e.g. reduced cough, sputum retention, hypoxia & hypoxaemia), Cardiovascular (e.g. increased myocardial oxygen demand, ischemia); Gastrointestinal (e.g. decreased gastric emptying, reduced gut motility, constipation); Genitourinary (e.g. urinary retention) and Psychological (e.g. anxiety, fatigue etc) system. There is some evidence that post-operative pain control has significant physiological benefit in patients (Charlton 1997).<sup>2</sup> Not only pain management results in earlier discharge from hospital, but also it may reduce the onset of chronic pain syndromes.

<b>QUICK RESPONSE CODE</b>	<b>DOI:</b> 10.13040/IJPSR.0975-8232.7(4).1773-79
	Article can be accessed online on: <a href="http://www.ijpsr.com">www.ijpsr.com</a>
DOI link: <a href="http://dx.doi.org/10.13040/IJPSR.0975-8232.7(4).1773-79">http://dx.doi.org/10.13040/IJPSR.0975-8232.7(4).1773-79</a>	

Nevertheless, post-operative pain remains grossly under treated, with up to 70% of patients reporting moderate to severe pain following surgery (Pyati 2007).<sup>3</sup>

In USA, survey of 250 patients who had undergone surgery in the last 5 years before 2008 revealed that 82% reported post-operative pain and 86% reported that pain intensity is either moderate, severe or extreme<sup>4</sup>

The goal for postoperative pain management is to reduce or eliminate pain and discomfort with minimum side effects as cheaply as possible (Breivik 2008).<sup>5</sup> The standard method of treating postoperative pain in the developed world is an intramuscular opioid (usually diamorphine or morphine), but other analgesics (paracetamol, NSAIDs) and local anesthetics may also be used (Taylor 2001).<sup>6</sup>

The non pharmacological methods can be used as adjuncts to the main method of pain relief. Herbal medicine, Hypnosis, Homeopathy, Meditation, Transcutaneous nerve stimulation (TENS), Acupuncture, Heat application are used as an adjuvant method to suppress pain perception.<sup>7</sup>

The aims of the work are to evaluate the best technique of anaesthesia as compared in the study. To select and evaluate the most appropriate analgesics to be used in Peri operative period to have a pain free post operative hospital stays and to evaluate the pain perception in immediate post operative period.

**MATERIALS AND METHODS:** It was a prospective observational study. Data was collected from indoor surgical patients of a tertiary care hospital located at Kolkata. Both males and females were included in age group of 18-60 years, ASA I & II status, abdominal, surface surgery and surgery in extremities which were up to 75 minutes duration were included in the study. ASA III & above, lengthy surgical procedures, neuro, cardiac & thoracic surgeries, patient with history of cardiovascular diseases, rate & rhythm disturbances, hypertension, were excluded. Recording of techniques of anaesthesia. preoperative evaluation of vitals, perioperative

vitals at 1, 10, 20, 30, 40, 50, 60, 75min and postoperative vitals at 2<sup>nd</sup> hr, 3<sup>rd</sup> hr, 4<sup>th</sup> hr, 5<sup>th</sup> hr, 6<sup>th</sup> hr. was noted. Assessment of Pain as per Visual Analog scale at completion of surgery, 2<sup>nd</sup> hr, 3<sup>rd</sup> hr, 4<sup>th</sup> hr, 5<sup>th</sup> hr & 6<sup>th</sup> hr. Assuming pain score 0 means no pain, 1-3 is mild, 4-6 is moderate & 7-10 is severe.

Statistical Analysis was performed with help of Epi Info (TM) 3.5.3. EPI INFO is a trademark of the Centers for Disease Control and Prevention (CDC). Descriptive statistical analysis was performed to prepare different frequency tables and to calculate the means with corresponding standard deviations. Chi-square test was applied as the measures of associations. Test of proportion was used to find the Standard Normal deviate (Z-values) and corresponding p-values for the test of differences between different proportions. T-test was used to compare the means.  $p < 0.05$  was taken to be statistically significant.

## RESULTS AND DISCUSSION:

In the whole study period 120 patients were included. Following data were obtained from the study population.

**TABLE 1: AGE DISTRIBUTION OF THE PATIENT**

Age Group (in years)	Number	%
18-30	45	37.5%
31-40	37	30.8%
41-50	12	10.0%
51-60	26	21.7%
Total	120	100.0%

**Table 1** shows mean age (Mean±SD) of the patients was 37.04±11.93 years with range 19-60 years and the median age was 33 years. Test of proportion showed most of the patients (68.3%) were significantly higher in the age group 18-30 years.

**TABLE 2: TECHNIQUES OF ANAESTHESIA & PATIENT DISTRIBUTION**

Technique	Number	Percentage
GA	59	49.2
Regional	61	50.8
Total	120	100

**Table 2** shows 49.2% of patients had undergone general anaesthesia and the remaining 50.8% patients undergone regional block.

**TABLE 3: AVERAGE PRE OPERATIVE VITALS IN DIFFERENT AGE GROUP**

Age Group	Systolic BP	Diastolic BP	Pulse
18-30	120.44±13.11	74.86±09.71	79.93±09.27
31-40	120.51±08.94	73.29±07.63	80.13±09.77
41-50	121.25±11.70	77.16±05.79	78.33±08.56
51-60	129.61±14.66	76.11±07.98	78.19±06.32
18-30	120.44±13.11	74.86±09.71	79.93±09.27

**Table 3** t-test showed that there was no significant difference in the average pre-operative vitals in different age group ( $p>0.05$ ).

**TABLE 4: STUDY DRUGS USED IN GA AND REGIONAL BLOCK IN PERI-OPERATIVE PERIOD**

Drugs	Technique			
	GA	%	Regional	%
F	32	54.2	40	65.6
F+D	14	23.7	5	8.2

**Table 4** shows that only Fentanyl was used in 54.2% of the patients under General anaesthesia and 65.6% of the patients under Regional analgesia. Fentanyl in combination with Diclofenac were given to 23.7% of the patients under general anaesthesia and 8.2% of the patients under regional analgesia. These patients were taken into consideration at the time of study of the peri & post-operative vitals and management of pain.

**TABLE 5: DISTRIBUTION OF PULSE RATES IN PRE & PERI-OPERATIVE PERIODS UNDER GA.**

Pulse Rate	F (n=32)	F+D (n=14)	t-value	p-value
PRE-OP	81.3±8.9	81.0±8.9	0.10	>0.05
PERI-OP				
1 min	83.5±9.6	86.3±7.5	0.96	>0.05
10 min	84.2±9.8	89.0±9.8	1.52	>0.05
20 min	84.1±9.6	89.0±6.8	1.53	>0.05
30 min	83.5±9.9	88.0±6.2	1.56	>0.05
40 min	83.0±8.2	87.2±5.8	1.53	>0.05
50 min	82.5±8.0	86.7±4.6	1.41	>0.05
60 min	82.7±7.5	87.4±5.9	1.47	>0.05
75 min	80.3±7.3	87.8±3.7	3.62	<0.01

**Table 5** t-test showed that pulse rate for Fentanyl was significantly lower than that for Fentanyl+Diclofenac at 75 minutes in the peri-operative period. There was no significant difference in pulse rate for the same groups in all other time intervals ( $p>0.05$ ). There was no significant difference in pulse rate for the two groups in pre-operative period ( $p>0.05$ ) which indicates that there was no biasness in the samples in post-operative period. Also there was no significant difference in pulse rate between pre-operative and at 75 minutes for Fentanyl ( $p>0.05$ ). But that was significantly higher for Fentanyl+Diclofenac ( $p<0.05$ ).

**TABLE 6: DISTRIBUTION OF DRUG COMBINATION DURING POST-OPERATIVE PERIOD IN GA**

Drugs	F	F+D	Total
D	2	1	3
P	23	10	33
P+T	1	1	2
PE+P	2	0	2
T	4	2	6
TOTAL	32	14	46

**TABLE 7: DISTRIBUTION OF PAIN SCORE IN POST-OPERATIVE PERIOD UNDER GA TREATED WITH F+P AND F+T**

Time	F +P				F+T			
	No	Mild	Moderate	Severe	No	Mild	Moderate	Severe
2 hr	3	1	19	0	1	0	3	0
3 hr	0	13	10	0	0	1	3	0
4 hr	0	22	1	0	0	3	1	0
5 hr	5	18	0	0	0	4	0	0
6 hr	3	1	19	0	1	0	3	0

**Table 7:** Test of proportion showed that pain was significantly decreased for F+P compared to F+T ( $p < 0.05$ ).

Mohammad Abdullah Al Masud et al, 2009 studied on pattern of use of analgesics in a surgical unit. They found that out of 180 prescriptions containing analgesics was collected randomly. The only drug in the operation day that was used was pethidine (90.6%). Associated analgesics in the operation day were tramadol (42.2 %). In first post-operative day most of the patients received single drug tramadol (48.3%), ketorolac (38.9%) and pethidine (0.6%). In second, third, fourth and fifth post-operative day most patients received tramadol 47.8%, 44.4%, 41.4% and 33.2% respectively. In this study they concluded that tramadol was found to be widely used post-operative analgesic with minimal side effects and better adherence to this drug by the patient.<sup>8</sup>

In this current study, the drug which is mostly used in the operation day was fentanyl (75.83%). And paracetamol (40.83%) was mostly used associated analgesics. Our study also concludes that pain is significantly decreased for Fentanyl+Paracetamol combination compared to Fentanyl+Tramadol.

Apfelbaum JL et al, 2003, studied postoperative pain experience. 250 adults who had undergone surgical procedures were selected randomly. Patients were asked about the severity of postsurgical pain, treatment, satisfaction with pain medication and perceptions about postoperative pain and pain medications. Approximately 80% of patients experienced acute pain after surgery. Of these patients, 86% had extreme pain, with more patients experiencing pain after discharge than before discharge. Experiencing postoperative pain

was the most common concern (59%) of patients. From the data they concluded that despite an increased focus on pain management programs and the development of new standards for pain management, many patients continue to experience intense pain after surgery. Additional efforts are required to improve patients' postoperative pain experience.<sup>9</sup>

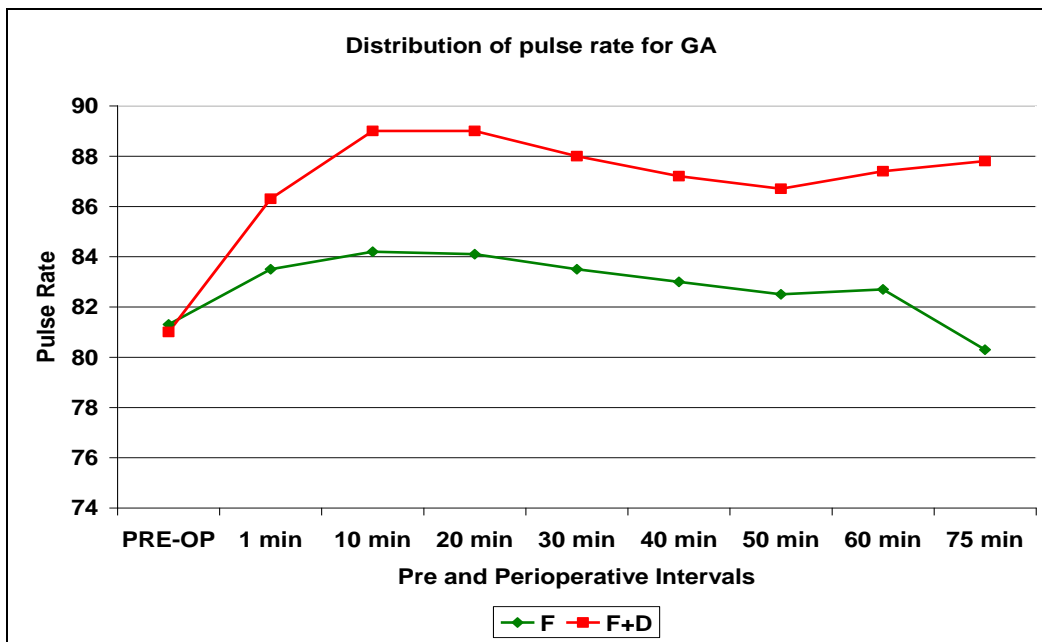
Spencer S. Liu, Christopher L, 2007 have studied the effect of analgesic technique on post-operative patient-reported outcomes including analgesia. In their study they concluded that although there are data suggesting that improved postoperative analgesia leads to better patient outcomes, there is insufficient evidence to support subsequent improvements in patient-centered outcomes such as quality of life and quality of recovery. Modest reductions in pain scores do not necessarily equate to clinically meaningful improved pain relief for the patient. Further studies are needed to develop validated patient-reported instruments and to assess the effect of analgesic techniques on patient-reported outcomes in the perioperative period.<sup>10</sup>

Comparing with the above studies, it is found in our study that most of the patients having mild to moderate pain in the post operative period. There is no patient who complained of severe pain. And in both techniques, when VAS score increases it signify that pain increases and when VAS score decreases that signify pain decreases. That means reduction of pain score signify improved pain management.

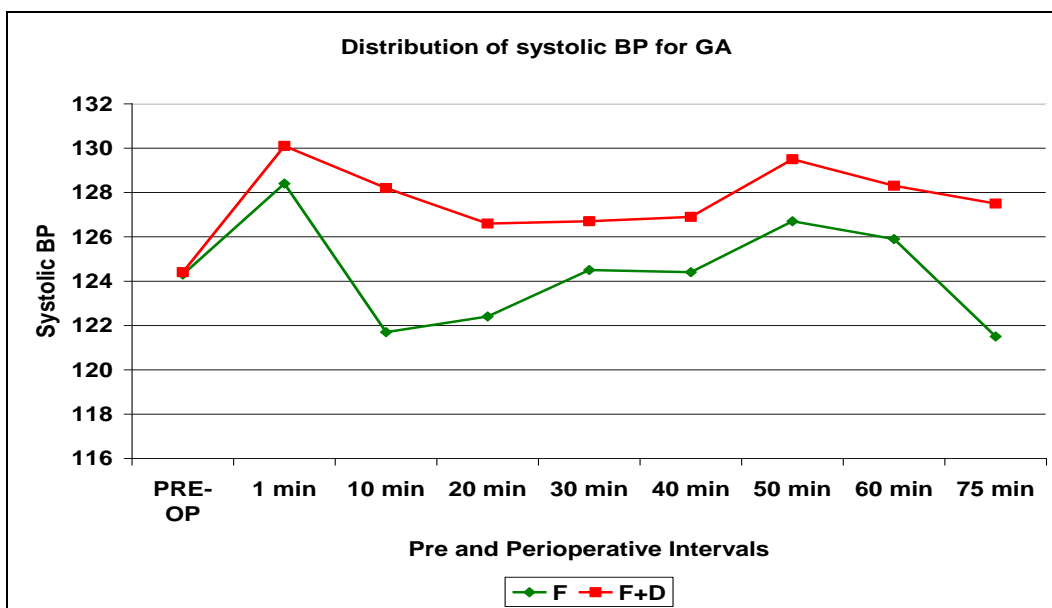
Also there was no significant difference in pulse rate between pre-operative and at 75 minutes for F and F+D ( $p > 0.05$ ).

**TABLE 8: DISTRIBUTION OF PULSE RATES IN PRE AND PERI-OPERATIVE PERIODS UNDER REGIONAL BLOCK**

Pulse Rate	F (n=40)	F+D (n=5)	t-value	p-value
PRE-OP	77.5±8.6	85.6±12.6	1.88	>0.05
PERI-OP				
1 min	80.8±7.7	97.0±10.3	4.28	<0.01
10 min	81.7±7.2	88.6±7.90	2.00	<0.05
20 min	82.3±6.9	87.0±9.80	1.37	>0.05
30 min	82.1±7.3	86.2±15.1	1.42	>0.05
40 min	80.6±6.3	84.4±10.1	1.47	>0.05
50 min	78.6±6.1	84.2±9.50	1.81	>0.05
60 min	78.0±5.7	82.2±8.90	1.63	>0.05
75 min	78.1±4.8	82.0±0.10	1.69	>0.05



**FIG. 1: DISTRIBUTION OF PULSE RATE FOR GENERAL ANAESTHESIA**



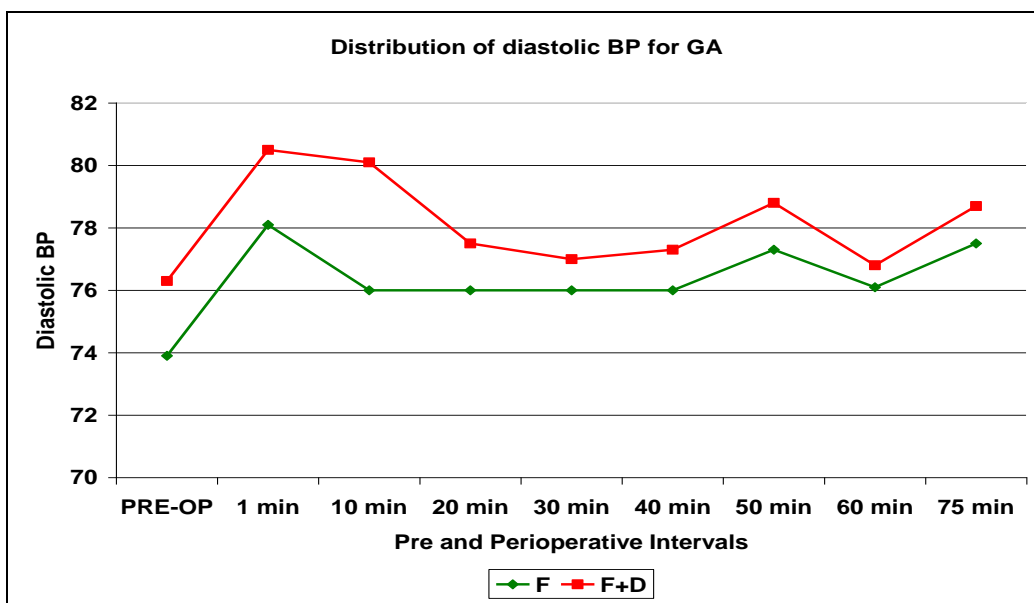


FIG.2: DISTRIBUTION OF SYSTOLIC & DIASTOLIC BP FOR GENERAL ANAESTHESIA

Mohammad Ali Attari et al, 2011 performed a comparative study between Spinal analgesia and general anesthesia for elective lumbar spine surgery. Seventy-two patients were enrolled in the study. They were categorized the study population with 37 patients in GA Group and 35 ones in SA Group. The heart rate (HR), mean arterial pressure (MAP), blood loss, with the operating conditions, the severity of postoperative pain based on visual analogue scale (VAS) and analgesic use were recorded. From this study they found that SA was superior to GA in providing postoperative analgesia and decreasing blood loss while maintained better perioperative hemodynamic stability without increasing adverse side effects.<sup>11</sup>

In our study it is found that, pain reappears in 5<sup>th</sup> hr after surgery in case of regional block. Patients feel mild pain at that hour. That signifies good postoperative analgesia.

In our observation, there was no significant variation of pre operative and postoperative pulse rate even at 75 minutes postoperative. There is some variation of preoperative systolic and diastolic blood pressure with that of post operative recordings at 75 minutes, though it is not statistically significant.

TABLE 9: DISTRIBUTION OF DRUG COMBINATION DURING POST-OPERATIVE PERIOD IN REGIONAL BLOCK

Drug Combination	F	F+D	Total
P	4	1	5
P+PH	0	1	1
P+T	2	0	2
PE+P	2	0	2
PE+P+PH	2	0	2
PE+PH	19	2	21
PE+PH+D	2	0	2
PE+PH+T	1	0	1
PH	1	0	1
T	7	0	7
T+D	0	1	1
TOTAL	40	5	45

**TABLE 10: DISTRIBUTION OF PAIN SCORE IN POST-OPERATIVE PERIODS UNDER REGIONAL BLOCK TREATED WITH F+PE+PH AND F+T**

Time	F+PE+PH				F+T			
	No	Mild	Moderate	Severe	No	Mild	Moderate	Severe
	<b>0</b>	<b>1-3</b>	<b>4-6</b>	<b>7-10</b>	<b>0</b>	<b>1-3</b>	<b>4-6</b>	<b>7-10</b>
4hr	19	0	0	0	4	3	0	0
5hr	0	19	0	0	0	7	0	0
6hr	2	17	0	0	2	5	0	0

**Table 10:** Test of proportion showed that there was no difference in decreasing pain ( $p>0.05$ ).

**TABLE 11: DISTRIBUTION OF PAIN SCORE IN POST-OPERATIVE UNDER REGIONAL BLOCK TREATED WITH F+D+PE+PH AND F+D+T IN POST-OPERATIVE PERIOD.**

Time	F+D+PE+PH				F+D+T			
	No	Mild	Moderate	Severe	No	Mild	Moderate	Severe
5hr	0	1	1	0	0	0	0	0
6hr	0	2	0	0	0	0	0	0

**Table 11** shows that only two patients who were treated with F+D+PE+PH were having mild to moderate pain at 5 hours after surgery. No patient treated with F+D+T.

**CONCLUSION:** This research shows that with reference to post operative analgesia, regional technique of anaesthesia is better than the general anaesthesia technique where both are applicable for the same surgery. Fentanyl has profound haemodynamic stability action. Pain was significantly decreased for Fentanyl+ Paracetamol combination compared to Fentanyl+Tramadol combination in general anaesthesia cases & In Regional anaesthesia cases Pethidine+ Phenergan shows same result as Tramadol HCl.

**ACKNOWLEDGEMENT:** The authors are grateful for the assistance of all doctors, nurse and other paramedical staff members of the tertiary care hospital located in Kolkata and all faculties of Jadavpur University, Kolkata for their support and honest cooperation. Authors also are grateful to CSIR-CGCRI, Kolkata and DST, New Delhi for their technical and financial support for carrying out the research and publishing the article.

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### How to cite this article:

Saha S, Chakraborty S, Chatterjee TK, Bandyopadhyay AK, Ray S and Chakraborty J: Prospective Observational Study on Peri-Operative Usage Pattern of Analgesics. *Int J Pharm Sci Res* 2016; 7(4): 1773-79. doi: 10.13040/IJPSR.0975-8232.7(4).1773-79.