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### Analgesics Usage Pattern among the Orthopaedics Surgery Patients and Their Effectiveness in Patient Satisfaction and Quality Of Life in a Tertiary Care Teaching Hospital.

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### Abstract

Pain management is a major concern for patients. Patients' perception of pain care became a vital criterion and a relevant outcome measure for healthcare institutions. Furthermore, patients' satisfaction with treatment is crucial to measure performance and success of healthcare institutions. Patients expect to receive optimal pain management resulting with prompt and effective pain control and few adverse effects from pain or its treatment. With this background this study is aimed to assess the analgesic usage pattern and patient satisfaction orthopedics surgery patients this observational in prospective study was conducted for a period of 6 months in 77 orthopedic surgery patients were randomly selected from the Department of orthopedics after obtaining ethics committee permission. Different analgesics, either as monotherapy or in combination were compared against

each other. Pain, mobility, self-care, usual activity, anxiety/depression, quality of life and discomfort scores were collected before treatment with analgesics and during discharge. The average difference in the scores among different treatment groups were calculated and checked for significance. It was found that Tramadol and Diclofenac combination was the most effective in pain reduction, improving mobility, self-care and quality of life the P value of 0.02, 0.01, 0.04 and 0.02 respectively while 3 drugs combination improved usual activity score and treated discomfort, anxiety effectively with P values 0.03, 0.04 and 0.08 accordingly.

**Keywords:** Analgesics, orthopedics, pattern, effectiveness, pain, satisfaction.

#### Introduction

Pain is the most feared problem among the patients. Poor pain control is an injustice to the patient. It is considered S

immoral, clinically implausible and non-lucrative <sup>(1)</sup>. Prescription pattern a part of medical auditing, results in better drug utilization and decrease untoward effects of drugs. Frequent analysis of prescription pattern can pave the way for making suitable and effective alterations to the current prescribing trends <sup>(2)</sup>. This study integrates both pain and prescribing pattern involving the analgesics usage. Analgesics are the drugs that affect the patient's pain sensorium without greatly affecting the impulse conduction <sup>(3)</sup>. A certain dose of same analgesic when given to two different patients can cause two distinct effects. This makes establishing an analgesic treatment guideline impossible. The fact that the pain is subjective and has no clinical diagnostic tool to detect, adding to the lack of guidelines makes it a perfect medium for abuse. Hence, this study was designed to evaluate the prescription pattern of analgesics and patient satisfaction, grading them in accordance to their effectiveness.

#### **Materials and Methods**

This observational prospective study was conducted for a period of 6 months in 77 orthopedic surgery patients were randomly selected from the Department of orthopedics after obtaining ethics committee permission. The patients belonged to a variety of surgery subsets and were older than 18 years. Patients below 18 years of age, mentally incapacitated patients and Patients not willing to give inform consent were excluded from the study.Patient demographic details, past medication history, diagnosis and drugs prescribed were collected using a data collection form. Patient's satisfaction details were attained by a personal interview with the patient or the patient's attender. After the surgery they were asked for their pain severity using Visual Analogue scale and dimensions of EQ 5 D 5 L questionnaires before analgesic administration and during discharge.

**Method of Analysis** The data were analyzed using descriptive statistics and the mean difference in patient's subjective aspects between treatment groups were analyzed using ANOVA and the results were presented by using frequency distribution table with Microsoft excel.

#### Discussion

With increasing number of articles suggesting inadequate pain management in post-surgery patients and misuse of analgesics, it is necessary to monitor and document analgesic prescription pattern on a regular basis <sup>(4) (5)</sup>. Hence, this study will enlist the analgesics prescription pattern in post-operative orthopedics surgery patients and correlate them with the patient's satisfaction and quality of life. This study reveals that the most common cause for orthopedic surgery is fracture at 75.35%. The patients belonged to both gender with predominantly male at 81.81% and the remaining 18.18% being female patients.

While sorting patients according to their age group, it was found that group 41-50 years contained most of the samples with 14 male and 6 female patients. The demographics were found to be consistent with similar article published by Padmanabha TS *et al.* on "Post-operative utilization pattern of analgesics in orthopedic department of a tertiary care teaching hospital" in Karnataka.

Table 1:	Age	wise	gender	distribution
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S.no	Age group	Number	of	Total	Percentage
		patients (	n=77)		(%)
		Male	Female		
1.	18-20	03	00	03	3.89
2.	21-30	12	01	13	16.88
3.	31-40	14	01	15	19.48
4.	41-50	14	06	20	25.97
5.	51-60	12	04	16	20.77
6.	61-70	05	02	07	9.09
7.	>70	03	00	03	3.89

#### Table 2: Types of surgery

S.no	Type of surgery	Total number of	Percentage of
		patients (n=77)	patients (%)
1.	Total Knee	10	12.98
	Replacement (TKR)		
2.	Bone Fracture Repair	58	75.32
	(BFR)		
3.	Implantation Surgery	02	2.59
	(IMP)		
4.	Spine surgery (IVDP)	06	7.79
5.	Total Hip Replacement	01	1.29
	(THR)		

The length of hospital stay ranged from 3 to 18 days, the average length of stay was found to be 6.71 days. The average number of analgesics per prescription was found to be 1.83 which is close to 1.46; the results stated by Dwijen Kumar Choudry and et al. on topic "Prescribing pattern of analgesics in orthopedic in-patient department at tertiary care hospital in Guwahati, Assam" The most prescribed route of analgesics administration is parenteral (83.90%) followed by oral (15.10%). With Opioid, acetaminophen and non-selective NSAIDs prescribed, it was observed that Tramadol was the most opted pain killer at 40.42% either as a monotherapy or in combination therapy followed by Acetaminophen at 29.07% and Diclofenac at 25.53%. This was not consistent with the study by Dwijen Kumar Choudry and et al. It stated Diclofenac as the commonly prescribed analgesic (43.49%).

#### **Table 3: Analgesics prescribed**

S.no	Analgesic prescribed	Number of Prescription	Percentage (%)
		( <b>n</b> =77)	
1.	Tramadol (T)	57	74.02
2.	Diclofenac (D)	36	46.75
3.	Acetaminophen (A)	41	53.24
4.	Ketoprofen (K)	3	3.89
5.	Indomethacin (I)	2	2.59
6.	Tramadol +	2	2.59
	Acetaminophen (T+A)		

The drugs co-administered with analgesics were classified into different types, most prescribed drugs being the

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supplements accounting to 29.62%. These are followed by antibiotics (25%), anti-ulcer drugs (21.60%), anti-emetics (13.88%), anxiolytics (2.16%), steroids (1.85%) and others (3.08%).

The samples were grouped into six treatment groups to analyze the effectiveness of treatment between each group. The different groups being Tramadol, Tramadol+ Acetaminophen, Tramadol + Diclofenac, Acetaminophen + Diclofenac, 3 drugs combinations (Diclofenac + Acetaminophen + Indomethacin/ Tramadol + Diclofenac + Acetaminophen/ Tramadol + Diclofenac + Ketoprofen) and other monotherapy with 11, 27, 17, 9, 5 and 8 number of patients respectively. The treatment groups were compared on the basis of Pain using VAS, and 5 dimensions of EQ 5D 5L including its quality of life scale using student t test and the results of such comparisons are as follows.

The maximum average pain reduction was observed in combination therapy with Tramadol + Diclofenac (45.0%) with a P value of 0.02. It is followed by Tramadol + Acetaminophen (42.2%), Acetaminophen + Diclofenac (40.0%), Tramadol (38.2%), 3 drugs combinations (36.0%) and other monotherapy (35.0%).

## Table 4: Pain scores before and after analgesicsadministration

S.no	Analgesic(s) prescribed	Average	Average	Average
		pain	pain after	pain
		before		reduction
1.	Tramadol (T)	6.72	4.81	1.91
2.	Tramadol+ Acetaminophen (T+A)	6.77	4.66	2.11
3.	Tramadol+ Diclofenac (T+D)	7.11	4.82	2.25
4.	Acetaminophen+ Diclofenac (A+D)	6.55	4.55	2.00
5.	3 drugs combination (3 DC)	6.60	4.80	1.80
6.	Other Monotherapy (D/A)	6.50	4.75	1.75

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The maximum mobility improvement was observed in combination therapy with Tramadol + Diclofenac (40%) a P value of 0.01. It is followed by 3 drugs combinations (36.0%), Tramadol + Acetaminophen (30.2%), Tramadol (25.4%), Acetaminophen + Diclofenac (17.6%), and other monotherapy (17.4%).

Table5:Mobilitybeforeandafteranalgesicsadministration

S.no	Analgesic(s) prescribed	Average mobility before	Average mobility after	Average mobility improvement
1.	Tramadol (T)	2.63	1.36	1.27
2.	Tramadol+ Acetaminophen (T+A)	3.25	1.74	1.51
3.	Tramadol+ Diclofenac (T+D)	3.58	1.58	2.00
4.	Acetaminophen+ Diclofenac (A+D)	2.22	1.33	0.88
5.	3 drugs combination (3 DC)	3.40	1.60	1.80
6.	Other Monotherapy (D/A)	2.87	2.00	0.87

The maximum average self-care improvement was observed in combination therapy with Tramadol and Diclofenac (29.4%) with P value of 0.04. It is followed by Tramadol + Acetaminophen (25.8%), other monotherapy (35.0%), 3 drug combinations (17.4%), Acetaminophen + Diclofenac (11.5%) and Tramadol (10.8%).

Table6:Self-carebeforeandafteranalgesicsadministration

S.no	Analgesic(s) prescribed	Average	Average	Average self-
		self-care	Self-care	care
		before	after	improvement
1.	Tramadol (T)	1.90	1.36	0.54
2.	Tramadol+	2.74	1.44	1.29
	Acetaminophen (T+A)			
3.	Tramadol+ Diclofenac	2.70	1.23	1.47
	(T+D)			
4.	Acetaminophen+	1.88	1.33	0.55
	Diclofenac (A+D)			
5.	3 drugs combination (3	1.80	1.00	0.80
	DC)			
6.	Other Monotherapy	3.00	2.12	0.87

(D/A) The maximum average improvement in usual activity score was observed in 3 drug combinations (32.0%) with P value of 0.03. It is followed by combination therapy with Tramadol + Diclofenac (28.2%), Tramadol + Acetaminophen (25.0%), other monotherapy (22.4%), Tramadol (14.4%) and Acetaminophen + Diclofenac (8.8%).

Table 7: Usual activity score before and afteranalgesics administration

S.no	Analgesic(s) prescribed	Average	Average	Average UA
		UA score	UA score	score
		before	after	improvement
1.	Tramadol (T)	2.09	1.36	0.72
2.	Tramadol+	2.77	1.51	1.25
	Acetaminophen (T+A)			
3.	Tramadol+ Diclofenac	2.82	1.41	1.41
	(T+D)			
4.	Acetaminophen+	1.88	1.44	0.44
	Diclofenac (A+D)			
5.	3 drugs combination (3	3.00	1.40	1.60
	DC)			
6.	Other Monotherapy	2.87	1.75	1.12
	(D/A)			

The maximum average discomfort score reduction was observed in 3 drug combination (36.0%) with P value of 0.04. It is followed by combination therapy with Tramadol + Acetaminophen (32.4%), other monotherapy (27.4%), Tramadol (27.2%), Tramadol + Diclofenac (25.8%) and Acetaminophen + Diclofenac (17.6%).

Table8: averagediscomfortbeforeandafteranalgesics administration

S.no	Analgesic(s)	Average	Average	Average
	prescribed	discomfort	discomfort	discomfort
		score	score after	score
		before		improvement
1.	Tramadol (T)	2.72	1.36	1.36
2.	Tramadol+	3.00	1.62	1.37
	Acetaminophen (T+A)			
3.	Tramadol+ Diclofenac	3.11	1.48	1.62
	(T+D)			
4.	Acetaminophen+	2.94	1.64	1.29

	Diclofenac (A+D)			
5.	3 drugs combination (3 DC)	2.22	1.33	0.88
6.	Other Monotherapy (D/A)	3.00	1.20	1.80

The maximum reduction in anxiety and depression scale was observed in 3 drug combination (8.0%) with the P value of 0.08. It is followed by combination therapy with Acetaminophen + Diclofenac (7.4%), Tramadol + Acetaminophen (5.0%), Tramadol (3.6%), other monotherapy (2.4%) and Tramadol + Diclofenac (2.2%).

Table9: Anxiety before and after analgesicsadministration

S.no	Analgesic(s)	Average	Average	Average Anxiety/
	prescribed	Anxiety/	Anxiety/	depression score
		Depression	depression	improvement
		score before	score after	
1.	Tramadol (T)	1.18	1.00	0.18
2.	Tramadol+	1.25	1.00	0.25
	Acetaminophen			
	(T+A)			
3.	Tramadol+	1.11	1.00	0.11
	Diclofenac (T+D)			
			1.00	0.44
4.	Acetaminophen+	1.11	1.00	0.11
	Diclofenac (A+D)			
5.	3 drugs	1.40	1.00	0.40
	combination (3			
	DC)			
6.	Other	1.12	1.00	0.12
	Monotherapy			
	(D/A)			

The maximum average QOL improvement was observed in combination therapy with Tramadol + Diclofenac (20.64%) with P Value of 0.02. It is followed by 3 drug combinations (19.00%), Tramadol (16.81%), Tramadol + Acetaminophen (16.7%), Acetaminophen + Diclofenac (14.44%) and other monotherapy (11.87%).

# Table 10: Quality of life before and after analgesicsadministration

S.no	Analgesic(s)	Average QOL	Average	Average QOL
	prescribed	before	QOL	improvement
			after	
1.	Tramadol (T)	40.00	56.81	16.81
2.	Tramadol+	33.51	50.22	16.70
	Acetaminophen			
	(T+A)			
3.	Tramadol+	34.64	55.29	20.64
	Diclofenac (T+D)			
4.	Acetaminophen+	38.88	53.33	14.44
	Diclofenac (A+D)			
5.	3 drugs	33.00	52.00	19.00
	combination (3 DC)			
6.	Other Monotherapy	50.62	50.62	11.87
	(D/A)			

Optimum sleep was observed in patients treated with 3 drug combinations (60%). It is followed by combination therapy of Tramadol + Diclofenac (47.50%), Tramadol + Acetaminophen (44.44%), other Monotherapy (37.5%), Acetaminophen + Diclofenac (33.33%) and Tramadol (18.18%).





While critically analyzing the prescription for possible drug interaction one serious, three moderate interactions and three minor interactions were detected although no effects were clinically observed in patients. Majority of the drug interaction threat was posed by Diclofenac accounting for 38.45% of the total interaction.

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Conclusion

This study concluded that fracture is the most common cause for orthopedic surgery. The new trend in the use of Tramadol than conventional NSAIDs was notices for pain management in orthopedic patients. It concludes that Tramadol and Diclofenac combination is the superior combination in treating pain, improving mobility, selfcare and quality of life. Whereas 3 drug combinations were effective in patients improving their ability to do usual activities, providing optimal sleep, reducing their anxiety/ depression and discomfort scale. These data will be helpful in treating patients based on their need, optimizing their treatment and look out for the possible drug interaction. The use of above information as a part of evidence based medicine will result in increased patient compliance and effective recovery. Regular educational interventions to improve prescribing practices among physicians at different levels may further promote rational prescribing.

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