

**Pre and postoperative pain in patient undergoing cardiovascular procedures:
Anaesthetic study**

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ABSTRACT

Background: Post-operative pain is distinctive from the pain experienced as a result of numerous chronic illnesses. The present is aimed to evaluation of pre- and POPM in cases undergoing cardiovascular operations.

Methodology: An cross-sectional study was carried out from March to November 2023. Participants were the in-hospital patients planning for coronary artery bypass grafting (CABG). The sampling was used to select the sample population and then informed consent was taken from each participant. Totally, 50 patients in the study population, of which 37 were males and 13 were females. Preoperative pain-related assessment was done one day before operations through a specific booklet designed by Canadian Pain Society Management: "Pain relief postsurgery".

Results: The mean age of the study population was 58.35 ± 10.55 years. The majority 33 (66%) of the cases were ≥ 55 years old. The male to female ratio was 3:1. Most of them (82%) were married. Totally 38 subjects were not work. Thirteen subjects were good graduated, while others were with illiterate (20). About 40 case with smoking tobacco. Forty (80%) participants opted for injectable route of administration for pain relief medicine. About 10% like skin patch as a route of drug administration for pain relief. However, the rest prefer other routes as oral or anal. The response from group to question-3 of the pre-operative pain questionnaire showed no significant differences. Statistics related to brief pain inventory (BPI) showed that a significant differences ($p=0.06, 0.02, 0.01$) were observed for all items. The overall brief pain inventory scale showed that the average pain score was statistically significant.

Conclusion: Pre-operative pain-related education to in-hospital cardiac patients played a significant role to achieve more effective post-operative patient care by enhancing the satisfaction

level among patients. Encouraged to communicate to medical personnel as they felt pain. It raised their willingness to take a stronger dose of medicine in order to relieve pain.

KEYWORDS: POP, BPI scale, Pain perception, cardiac surgeries, pain medications

Introduction

Post-operative pain is distinctive from the pain experienced as a result of numerous chronic illnesses [1]. Poor pain controlling can lead to several complications like deep vein thrombosis, pulmonary embolism and pneumonia, which are not only raises the medical cost and hospital stay but dropping patient safety and satisfaction [2].

Post cardiac procedures, patients' total recovery is affected by their subjective experience of pain. Postoperative discomfort is the most poorly handled feel reported after cardiac procedures which affect by patient views, cultural values, physiological characteristics, hospital policies and healthcare staff' knowledge and opinions [2].

Ineffective pain management undoubtedly due to an imbalance in physiological homeostasis that further decrease life quality and even raises morbidity [3].

The most valid method for measuring postoperative pain (POP) is a numerical rating scale that is unidimensional and simply measures pain severity [4, 5]. The clinical and psychological health of the patients can be deteriorated through untreated acute POP and if not addressed timely then it turned into chronic pain [6].

Pain is the primary symptom that drives individuals to the hospital and it is the most prevalent complaint affecting about 80% of hospitalized patients [7].

Despite of advances in postoperative pain management (POPM), the majority of cases continue to report experiencing extreme pain after surgery [8].

The present is aimed to evaluation of pre- and POPM in cases undergoing cardiovascular operations.

Methods

An cross-sectional study was carried out from March to November 2023. Participants were the in-hospital patients planning for coronary artery bypass grafting (CABG).

The sampling was used to select the sample population and then informed consent was taken from each participant.

Totally, 50 patients in the study population, of which 37 were males and 13 were females. Their age ranged from 44 to 75 years.

Preoperative pain-related assessment was done one day before operations through a specific booklet designed by Canadian Pain Society Management: “Pain relief post-surgery”. A questionnaire involving demographic characters, pain pre-procedural assessment, analgesia perception and post-operative pain therapy questionnaire along with a brief pain inventory scale (BPI) was used as a study tool.

The data was analysed by SPSS version 21. The chi-square test was used. The value of significant was taken as ≤ 0.05 . **Results**

The mean age of the study population was 58.35 ± 10.55 years. The majority 33 (66%) of the cases were ≥ 55 years old. The male to female ratio was 3:1. Most of them (82%) were married. Totally 38 subjects were not work. Thirteen subjects were good graduated, while others were with illiterate (20). About 40 case with smoking tobacco. (Table 1).

Table 1: Demographic characters.

Age (years)	No.	%
44-54	17	34
≥ 55	33	66
Gender		
Male	37	74
Female	13	26
Marital Status		
Married	41	82
Single	9	18
Job		
Not work	38	76
work	12	24
Education level		

Illiterate	20	40
Good	30	60
Smoking		
Yes	40	80
No	10	20

Forty (80%) participants opted for injectable route of administration for pain relief medicine. About 10% like skin patch as a route of drug administration for pain relief. However, the rest prefer other routes as oral or anal. (Figure 1).

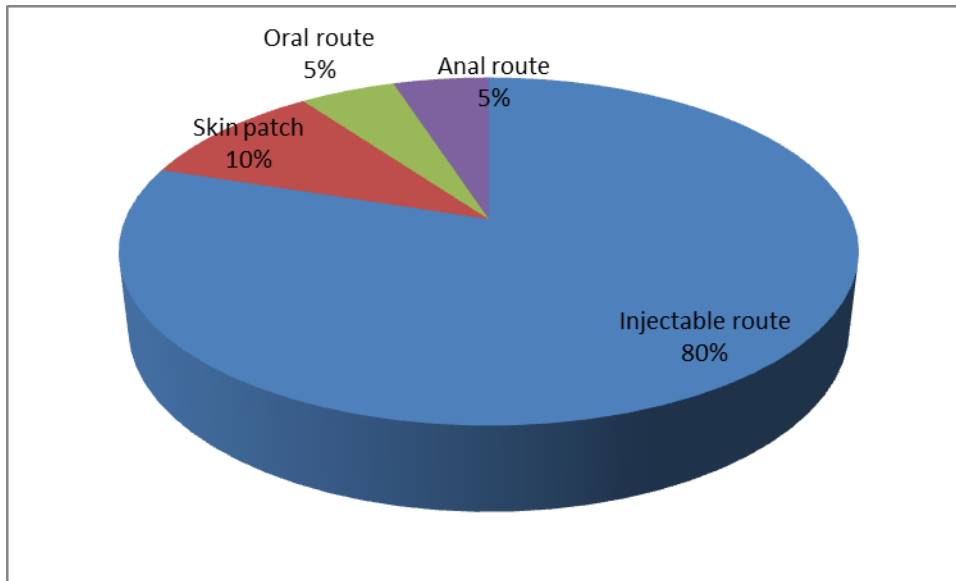


Figure 1: Route of administration for pain relief medicine.

The response from group to question-3 of the pre-operative pain questionnaire showed no significant differences (Table 2).

Table 2: Responses related to the questionnaire.

Q	3-point Likert scale response*		No.	Chi-Square Test	
				χ^2	<i>p-value</i>
Q1: Pain postsurgery, time of painrelief medicine?	A	Just pain	11	0.1	0.6
	B	Severe pain	20		
	C	When offered	10		
	D	With the pain rather than have medicine	9		
Q2: Pain-relief medicine, time be given?	A	With the pain for as long as	24	1.4	0.8
	B	Immediately	10		
	C	When the nurse isn't busy	4		
	D	Next giving medication	2		
Q3: What kind of non-drug treatment do you want to use for pain relief?	A	Pillow	10	2	0.4
	B	Massage	30		
	C	Application of heat	9		
	D	Music, reading, mobile	1		

Statistics related to brief pain inventory (BPI) showed that a significant differences ($p=0.06, 0.02, 0.01$) were observed for all items. The overall brief pain inventory scale showed that the average pain score was statistically significant (Table 3).

Table 3: The brief pain inventory (BPI).

item	Q	Mean±SD	Independent samples t-test	
			<i>t</i>	<i>P</i>
1	Have you had pain other than post-surgery pain?	2.2±0.34	4.1	0.05
2	Rate your pain by circling the number	8.3±2.9	4.2	0.02
3	How much relief has pain treatment or medication provided?	89.5±6.7	14.3	0.01
Mean Pain Scores		16.5±6.3	20.2	<0.0001

Discussion

In 2017, Canadian Institutes of Health Information’s Cardiac Care Quality Indicators Report emphasized acquiring advanced opportunities to keep on improving the standards of postoperative cardiac care [9]. Pain-related subject education improve the basic knowledge and abilities, so that they can manage pain by themselves after their discharge from the hospital [10]. A study reported that old erroneous beliefs based on inaccurate knowledge were one of the prime contributors to ineffective postoperative acute pain management [11].

In 2015, a systematic review concluded the efficacy of preoperative education for patients with cardiac surgeries. However, the findings not supported the correlation. Future studies by researchers in this regard could helpful to clearance this grey data and undoubtedly the training of related paramedics could raise the effectiveness of the preoperative education to deliver the best postoperative services and achieve more patient satisfaction [2].

Kashif et al. [12] showed significantly elevated pain scores at the postoperative phase. Similar to the present study another trial was performed by Azizi et al. [13] reported the parallel findings of

enhanced patients' response to POP handling in that group who received pain-related education preoperatively than the control group.

Ramesh et al. [14] concluded that preoperative analgesia-related patient education lead to a decline in postoperative anxiety amongst cardiac patients who received the surgical intervention. Another review coinciding with our data stated that preoperative educational sittings catering to medicinal, emotional, and monetary aspects with patients who underwent spinal surgeries undoubtedly reduce their depression/fear and improve their pain-related perception. Thus encouraging them to respond in a better way to postoperative patient management [15]. Klaiber et al. [16] declared that seminars for preoperative education to the patients led to an elevate in the satisfaction level in terms of pain perception and mood elevation.

In Pakistan, a study by Michal et al. [17] suggested the requirement to educate patients before their cardiac surgery in relation to drug addiction, side effects and physical movements in order to improve their pain perception in postoperative times.

In India, authors stated that 80% of patients with acute POP reported the negligible use of non-pharmacological pain-relief methods [18]. However, the relevance of various kinds of non-medicinal support as adjunct pain-relief measures can never be denied by the literature [19]. The current study observed that preoperative patient education leads to a decline in the mean pain scores of patients after cardiac surgery. The same found in Turkish study, that preoperative individualized education to cardiac patients has a significant role in dropping their anxiety and thereby reducing their pain scores post-surgically [20].

Sharma et al. [21] declared that 100% of the patients felt PPP during the very first 24 hours after the operation. Their average pain score was 4.9 ± 1.5 , and the worst pain grade was 7.6 ± 1.5 at that time.

Venkatesan et al. [22] declared perception of severe POP by 70% of patients with general surgeries. Comparatively Ramia et al. [23] reported that 50% of obstetric and 37% of orthopaedic patients had experienced severe pain postoperatively.

The POP may last up to 3 months nevertheless a gradual regression in pain perception was noted with the raise in the healing of the related tissue [24].

Conclusion

Pre-operative pain-related education to in-hospital cardiac patients played a significant role to achieve more effective post-operative patient care by enhancing the satisfaction level among patients. Encouraged to communicate to medical personnel as they felt pain. It raised their willingness to take a stronger dose of medicine in order to relieve pain.

Disclosure None

References

1. Akhtar J. Challenges in the management of postoperative pain. *Journal of Surgery Pakistan*. 2022; 27(1):1-2.
2. Ferdoush J, Chowdhury RP, Johora F, Arifina R, Jeenia FT, Ata M, Parveen K, Hossain SM, Sharmeen S, Rahman MS. Post-Operative Pain Management and Patient Satisfaction, Experience at a Tertiary Care Hospital. *Chattagram Maa-O-Shishu Hospital Medical College Journal*. 2021; 20(2):69-73.
3. Khalid A, Kausar S, Sadiqa A, Abid A, Jabeen S. Relevance of Preoperative Pain Education To The Cardiac Patients on Their Response To Postoperative Pain Therapy, Preoperative Pain Education to the Cardiac Patients. *Pakistan BioMedical Journal*. 2022; 2(28):147-51.
4. Gélinas C, Shahiri S, Richard-Lalonde M, Laporta D, Morin JF, Boitor M, Ferland CE, Bourgault P, Richebé P. Exploration of a multi-parameter technology for pain assessment in postoperative patients after cardiac surgery in the intensive care unit, the nociception level index (NOL) TM. *Journal of Pain Research*. 2021; 14:37-23.
5. Baamer RM, Iqbal A, Lobo DN, Knaggs RD, Levy NA, Toh LS. The utility of unidimensional and functional pain assessment tools in adult postoperative patients, a systematic review. *British journal of anaesthesia*. 2022; 1:5.
6. Belay Bizuneh Y, Fitiwi Lema G, Yilkal Fentie D, Woldegerima Berhe Y, Enyew Ashagrie H. Assessment of patient's satisfaction and associated factors regarding postoperative pain management at the University of Gondar Compressive Specialized Hospital, Northwest Ethiopia. *Pain Research and Management*. 2020; 11(12):20-20.

7. Zeleke S, Kassaw A, Eshetie Y. Non-pharmacological pain management practice and barriers among nurses working in Debre Tabor comprehensive specialized Hospital, Ethiopia. *Plos one*. 2021; 6 (15):16-6.
8. Kasahun HG, Agizew TB, Temesgen MM, Ashagrie HE. Assessment of acute postoperative pain management and associated factors after elective surgery among adult surgical patients, a prospective cross-sectional study. *IJS Short Reports*. 2022; 1(1):7-1.
9. Tran DT, Welsh RC, Ohinmaa A, Thanh NX, Bagai A, Kaul P. Quality of acute myocardial infarction care in Canada, a 10-year review of 30-day in-hospital mortality and 30-day hospital readmission. *Canadian Journal of Cardiology*. 2017; 1(33):1319-26.
10. Tan M, Law LS, Gan TJ. Optimizing pain management to facilitate enhanced recovery after surgery pathways. *Canadian Journal of Anesthesia/Journal canadien d'anesthésie*. 2015; 62(2):203-18.
11. Wang Y, Liu Z, Chen S, Ye X, Xie W, Hu C, Iezzi T, Jackson T. Pre-surgery beliefs about pain and surgery as predictors of acute and chronic post-surgical pain, a prospective cohort study. *International Journal of Surgery*. 2018;1(52):50-5.
12. Kashif M, Hamid M, Raza A. Influence of Preoperative Anxiety Level on Postoperative Pain After Cardiac Surgery. *Cureus*. 2022; 2(13):14-2.
13. Azizi A, Khatibian M, Mohamadian A, Soltanian A, Salehzadeh Glonduz F. Effect of Patient Education About Patient-controlled Analgesia Pump Preoperative on Severity of Pain, Nausea and Vomiting After Spinal Culumn Surgery. *Avicenna Journal of Nursing and Midwifery Care*. 2020;27(6):405-14.
14. Ramesh C, Nayak BS, Pai VB, Patil NT, George A, George LS, Devi ES. Effect of preoperative education on postoperative outcomes among patients undergoing cardiac surgery, a systematic review and meta-analysis. *Journal of PeriAnesthesia Nursing*. 2017; 32(6):518-29.
15. Burgess LC, Arundel J, Wainwright TW. The effect of preoperative education on psychological, clinical and economic outcomes in elective spinal surgery, a systematic review. *InHealthcare* 2019; 21 (7):1-48).
16. Klaiber U, Stephan-Paulsen LM, Bruckner T, Müller G, Auer S, Farrenkopf I, Fink C, Dörr-Harim C, Diener MK, Büchler MW, Knebel P. Impact of preoperative patient education on

- the prevention of postoperative complications after major visceral surgery, the cluster randomized controlled PEDUCAT trial. *Trials*. 2018;19(1):1-2.
17. Micah S, Barolia R, Parpio Y, Kumar S, Sharif H. Factors associated with postoperative pain among patients after cardiac surgery in the tertiary care teaching hospital of Karachi, Pakistan. *Pain research and treatment*. 2019;2019.
 18. Komann M, Weinmann C, Schwenkglenks M, Meissner W. Non-pharmacological methods and post-operative pain relief, An observational study. *Anesthesiology and pain medicine*. 2019; 9(2).
 19. van der Wal-Huisman H, Dons KS, Smilde R, Heineman E, van Leeuwen BL. The effect of music on postoperative recovery in older patients, A systematic review. *Journal of geriatric oncology*. 2018; 9(6):550-9.
 20. Ertürk EB, Ünlü H. Effects of pre-operative individualized education on anxiety and pain severity in patients following open-heart surgery. *International journal of health sciences*. 2018;12(4):26.
 21. Sharma SK, Thakur K, Mudgal SK, Payal YS. Acute postoperative pain experiences and satisfaction with its management among patients with elective surgery, An observational study. *Indian Journal of Anaesthesia*. 2020;64(5):403.
 22. VENKATESAN U, KAMAL S, VISWANATHAN J. Perception of Pain, Attitude and Satisfaction of Pain Management among Postoperative Patients. *Journal of Clinical & Diagnostic Research*. 2021; 1(15):1.
 23. Ramia E, Nasser SC, Salameh P, Saad AH. Patient perception of acute pain management, data from three tertiary care hospitals. *Pain Research and Management*. 2017;2017.
 24. Zubrzycki M, Liebold A, Skrabal C, Reinelt H, Ziegler M, Perdas E, Zubrzycka M. Assessment and pathophysiology of pain in cardiac surgery. *Journal of pain research*. 2018;11:15-99.