

Patients' Pain Experience After Coronary Artery Bypass Graft Surgery

Mohannad Eid AbuRuz¹. PhD., RN. Fawwaz Abdulqader Alaloul². PhD., RN.

¹Education Coordinator, King Fahad Specialist Hospital, Dammam, KSA

²Assistant Professor, College of Nursing, Hashemite University, Zarka, Jordan

mohannadeid@yahoo.com

Abstract: Pain after Coronary Artery Bypass Graft Surgery (CABG) is very common and severe in the first 48 hours. Almost all patients post CABG will spend this time in the Intensive Care Unit (ICU). Therefore, it is difficult for the patients to report their pain due to different factors which include but not limited to: mechanical ventilation, altered levels of consciousness, and sedation administration. Patients use different terms to describe their pain, as aching, throbbing, pressure and pain due to the lack of sleep when they are able to communicate effectively. The purpose of this study was to describe the pain experience for patients undergoing CABG in the first 48 hours after surgery in ICU, and determine the factors that affect the pain level. A total of 150 patients who underwent CABG participated in this study from a major private center specialized in cardiac surgery in Amman, Jordan. These patients spent at least 48 hours in surgical ICU and had at least one chest tube. Data were collected by trained research assistants when patients were transferred to the surgical ward and they were hemodynamically stable. Most of the patients (n=60) described pain as throbbing and (n= 55) aching. Activities that increased pain were: Suctioning (n=55), lack of sleep (n= 50) the presence of chest tube (n=50), and dressing change (n=30). The most important factors that decreased pain were: Use of analgesia (n=120) and keeping immobile (n=30). In conclusion, pain is a very subjective experience that can be described in different ways by the patients. There are different nursing activities that affect patient's pain level which can be modified to control that pain.

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1. Introduction

All patients who underwent CABG will be admitted to the ICU for at least 48 hours. These patients usually have sternal incisions and chest tubes. The environmental and the psychological stressors in the ICU aggravate pain feeling for those patients. The negative effects of these stressors include release of different inflammatory markers, stimulation of cardiovascular system (Aslan, Badir, Arli, & Cakmakci, 2009; Xie, Kang, & Mills, 2009), adrenal and pituitary glands which all intern increase pain levels.

Different nursing activities increase patient pain levels especially during morning care, dressing change, suctioning, moving the chest tube and chest physiotherapy. Pain in ICU was associated with higher rate of complication (Milgrom et al., 2004; Puntillo & Weiss, 1994; Puntillo, 1990; Puntillo et al., 1997; Puntillo et al., 2004) morbidity and mortality (Puntillo & Weiss, 1994; Puntillo, 1990; Puntillo et al., 1997; Puntillo et al., 2004) if untreated properly. The hypothesized theory for that is: pain will stimulate the central nervous system which release epinephrine and nor epinephrine. The release of these hormones will increase the workload of the heart and oxygen consumption. In patients with CABG, this will be very serious leading to postoperative complications. We demonstrated in

previous studies that high levels of anxiety, which has the same mechanism of action discussed above, will be associated with more complication rate for patients with acute coronary syndrome (Abu Ruz, Lennie, & Moser, 2011; Abu Ruz et al., 2010; McKinley et al., 2012). Atelectasis and pneumonia can result due to immobility resulting from chest tube pain. Accumulation of secretions and inability to cough due to chest tube pain are other precipitating factors for pneumonia (Puntillo & Weiss, 1994; Puntillo, 1990; Puntillo et al., 1997; Puntillo et al., 2004)

Most of the times post CABG patients will be intubated for the first 48 hours which make it very difficult for those patients to verbalize their pain. Moreover, the pain will be the worse during this period. Therefore, it is important to study the patient's pain behavior. Pain is a subjective multidimensional experience and for this reason it is crucial to let the patients verbalize their own feeling when nurses assess the pain level. There are studies talking about pain assessment and management in general, but few studies described the patients' experience post CABG.

2. Material and Methods

General Objective: The major goal of this study was to describe the pain for patient who underwent CABG

Research questions:

1. What was/were the nature(s) of the pain post CABG?
2. What were the nursing actions that affect pain level post CABG?

Research design and setting: A descriptive design was used in this study. The study was conducted in the surgical wards of a major private medical center specialized in cardiac surgery in Amman, Jordan. This center is a specialized cardiac-referral hospital from all over Jordan and other close by Arabic countries.

Sample: The sample of this study was all adult patients who performed CABG in this center during the data collection time (Oct-December 2012) and met the following inclusion criteria: 1) signed informed consent, 2) 18 years old and above, 3) had a sternal incision, 4) had at least one chest tube, 5) intubated during ICU stay or at least for 6 hours, 6) no previous psychiatric disorder, 7) no communication problems, and 8) can speak Arabic

Ethical Considerations:

After the ethical committee in the center read the proposal and gave the approval, a letter confirming that was sent to the Principle Investigator by the medical director accepting doing the study at the center. Research assistants explained the study to the participants and all of them signed informed consent before data collection.

Data Collection:

Data Collection instrument: Had two parts. The first section contains questions about the socio-demographics and the second portion consists of questions regarding patients' pain experience and clinical characteristics. These questions were developed based on the updated literature review and the opinion of expert nurses in the pain management field. The content validity of these questions was verified by the opinion of 5 expert nurses in cardiovascular ICU and pain management in ICU other than those who helped in developing these questionnaires.

Data Collection Procedure:

Data were collected by trained research assistants who contacted the participants within the first 48 hours of their transfer to the surgical ward by face to face interview. All other clinical characteristics that can not be answered by the patients were extracted from the medical records. Inter-rater reliability among the research assistant was 96%. All of them asked to extract data from 5 files and the Principle Investigator checked them for consistency.

Data Analysis: SPSS software version 20.0 was used to analyze the data. Descriptive statistics with numbers and frequencies was used for the purposes of this study.

3. Results

The mean age for the participants was 67.3 ± 10.9 . Most of the participants were male 70% and married 60.7%. Approximately three quarters were hypertensive, and 20% doing the CABG for the second time. Majority of the patients 79.3% has an admitting diagnosis with unstable angina, followed by acute myocardial infraction 10.6% and finally stable angina 10%. One hundred twenty (80%) participants were on morphine sedation during their stay in the ICU. Table 1 shows the sociodemographic and clinical characteristics of participants in the study.

Table 1. sociodemographic and clinical characteristics of participants in the study.

Characteristics	N(%), M \pm SD
Age	67.3 \pm 10.9
Gender	
Male	105 (70)
Female	45 (30)
Marital status	
Married	91 (60.7)
Widowed	24 (16)
Divorced	17 (11.3)
Single	18 (12)
Education	
Some high school	28 (18.7)
Completed high school	19 (12.7)
Some college university	23 (15.3)
Completed college university	70 (46.6)
Graduate studies	10 (6.7)
History of hypertension	111 (74)
History of diabetes	56 (37.3)
History of CABG	30 (20)
History of stent	63 (42)
History of PTCA	71 (47.3)
Smoker	35 (23.3)
Use of morphine during hospitalization	120 (80)
Admitting diagnosis prior to CABG	
Stable angina	15 (10)
Unstable angina	119 (79.3)
Acute myocardial infraction	16 (10.6)

The nature of the pain was described by the patients in six categories. The categories, numbers and percentages are represented in table 2.

Table 2. The nature of the patients' pain experience*

Pain description	N	%
Throbbing	60	34.7
Aching	50	29
Stabbing	34	19.6
Burning	15	8.7
Difficulty in breathing	8	4.6
Restriction to movement	6	3.4

*More than one patient gave more than one choice

When the patients were approached about factors that increased their pain, approximately one third of the sample did not remember what caused their pain. Other factors included suction, followed by lack of sleep, presence of chest tube and dressing change (Table 3). Morphine used as continuous infusion was the most important pain relieving intervention identified by the participants 120 (80%). Keeping immobile was identified as one of the most important mechanisms to decrease pain

Table 3. Activities and causes that increased pain*

Activity/Cause	N	%
I can't remember	45	30
Suction	35	23.3
Lack of sleep	27	18
Presence of chest tube	24	16
Dressing change	19	12.7

*More than one patient gave more than one answer

4. Discussions

To our knowledge, this was the first study that described the nature of the pain and the activities/causes that increased or decreased pain for patients doing CABG in Jordan while a patients in ICU. Comparable to previous studies(Aslan et al., 2009; Gelinas, 2007; Puntillo, 1990; Valdex & Puntillo, 1995), 45 patients (30%) did not remember having pain in ICU. On the other hand, 105 patients (70%) remembered that they have pain in the ICU(Aslan et al., 2009; Gelinas, 2007). The fact that those patients did not remember the pain in ICU does not mean that they did not have pain. Most of those patients involved in this study, 120 (80%) was on continuous analgesia drip of morphine which has a sedative effect and this might explain why they did not remember having pain in the ICU.

This study showed that the highest percentage of the patients described their pain as throbbing, aching and stabbing (83.3%). Studies done on the nature of chest pain described that as sharp, stabbing (Puntillo et al., 2001), burning and throbbing (Gelinas, 2007), and aching(Aslan et al., 2009). Based on these description, we can conclude that the pain is a very subjective experience and the

nurses should document the assessment verbatim as the patients described it (McCaffery, 2004)

In this research, 23.3% participants mentioned suctioning was a cause for pain for them. Studies conducted on intubated patients (Arroyo-Novoa et al., 2008; Aslan et al., 2009), supported our findings. Suctioning caused discomfort for 30% of the patients. As with any surgery, patients post CABG incision will be covered by a dressing. Furthermore, there will be additional dressing covering the site of the chest tube when it is removed. To avoid infection, these dressings should be changed. Dressing change is one factor that induced pain in this sample. This is consistent with the previous studies done about pain in ICUs(Aslan et al., 2009; Puntillo et al., 2001)

One of the inclusion criteria in this study was to have a sternal incision and at least one chest tube. The presence of the chest tube for patients doing CABG with sternal injury is classical. The presence of the chest tube will interfere with patients' movement, sleep and turning over in the bed (Aslan et al., 2009; Hallenberg, Bergbom-Engberg, & Haljamae, 1990; Milgrom et al., 2004; Puntillo, 1990) In our study, lack of sleep and chest tube were identified as causes for pain in 41.3% of the patients. This pain usually results from the movement of the chest tube, which make it difficult for the patients to sleep. In a study done by Miller and Newton (Miller & Newton, 2006) they concluded that there is a positive relationship between the length of stay of the chest tube and the severity of the patients' pain as well as other complications.

Management of pain after cardiac surgery decreases the mortality and morbidity (Puntillo, 1990; Shannon & Bucknall, 2003). Therefore, activities that increase the pain should be controlled. Eighty percent of the participants were on morphine infusion which controlled their pain. Previous studies(Aslan et al., 2009; Lahtinen, Kokki, & Hynynen, 2006; Milgrom et al., 2004; Mueller et al., 2000; Puntillo et al., 2004) exposed that movement increased pain. In this study, 3.4% mention that they had pain when they move, that's why they restricted their movement. Keeping immobile is very dangerous for any post operative patients and especially cardiothoracic surgery. This will increase the risk of different complication including respiratory complications and deep vein thrombosis.(Aslan et al., 2009; Puntillo & Weiss, 1994; Puntillo, 1990; Puntillo et al., 1997) Therefore it is very important for nurses to assess pain for those patients frequently using all the methods that can be used in the ICU (Aslan, Badir, & Selimen, 2003)

5. Conclusion

Pain is a very subjective experience and is an existing problem in the surgical ICUs. Almost all patients post CABG surgery complain of pain that might increase their morbidity and mortality. Patients might be unable to communicate that they have pain due to sedation and intubation. Therefore, ICU nurses should routinely assess and reassess patients for pain. Understanding which factors that increased the pain will help us determine the appropriate strategies to treat it.

Corresponding Author:

Dr. Mohannad Eid AbuRuz

Education Coordinator, Critical Care Units

Kink Fahad Specialist Hospital, Dammam, KSA

E-mail: mohannadeid@yahoo.com

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