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### PHYSIOTHERAPY MANAGEMENT IN POST OPERATION CABG (CORONARY ARTERY BYPASS GRAFT) : A CASE STUDY

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#### Abstract

**Introduction** : Coronary Artery Bypass Graft (CABG) is a surgical procedure to restore normal blood flow to the heart by bypassing blocked coronary arteries. The purpose of this study was to determine the effectiveness of giving Deep Breathing Exercise in cases of postoperative CABG (Coronary Artery Bypass Graft).

**Case Presentation**: A 55 year old man with a dentist job. The patient complains of pain in the chest that was incised, pain occurs when sneezing or coughing.

**Management and Outcome** : The patient is given deep breathing exercise. Do repetitions for 1 minute with a break of 2 seconds for each repetition, done 2 times a day. Pain was measured using the NPRS (Numeric Pain Rating Scale).

**Discussion** : After being given therapy, it was found that there was a decrease in motion pain as much as 2 points which was measured using NRS where the values at T(beginning):5 and T(end) were:3.

**Conclusion** : Giving therapy in the form of deep breathing exercise modality can reduce chest pain (incise scar) in patients after CABG (Coronary Artery Bypass Graft) surgery.

**Keywords** : Coronary Artery Bypass Graft (CABG), Pain, Deep Breathing Exercise



## Introduction

*Coronary Artery Bypass Graft (CABG)* is defined as a surgical procedure to restore normal blood flow to the heart by bypassing blocked coronary arteries. Although surgical techniques requiring anesthesia and postoperative care techniques have improved rapidly, the rate of pulmonary complications (PPC), including pleural effusion atelectasis, pneumonia and pneumothorax after CABG surgery is still common. Deteriorating respiratory muscle condition is one of the important factors in PPC, decreased respiratory muscle strength after CABG surgery resulted in increased mortality after surgery and increased duration of hospitalization [10]. Data obtained from the 2013 Basic Health Research shows that the prevalence of coronary heart disease increases with age, the highest in the 65-74 year age group at 2.0% and 3.6% decreasing slightly in the 75 year age group. The prevalence of CHD diagnosed by a doctor or based on a doctor's diagnosis or symptoms was higher in women (0.5% and 1.5%). The prevalence of coronary heart disease is higher in people who do not go to school and do not work and the prevalence is higher in urban areas [3]. Cardiovascular disease is still a public health problem worldwide, causing a third of all deaths in 2030. More than a third of these deaths occur in adults (elderly). The incidence of heart disease is constantly increasing due to an epidemiological transition involving atherosclerosis, hypertension and associated lifestyle risk factors such as diet, smoking, and physical activity [14].

CABG is a revascularization procedure indicated in patients with coronary artery circulatory disorders, for example due to occlusion in acute myocardial infarction. This action aims to improve the quality of life and reduce the risk of mortality. The basic principle of this CABG procedure is to use other blood vessels as a bypass route for narrowed coronary arteries [8]. However, pain is still the main manifestation reported by patients. Studies show that from 47 to 75% of patients report pain in the postoperative period of cardiac surgery. Untreated acute pain can become chronic pain. The incidence of chronic post-stereotomy pain ranged from 18 to 61% in different samples. There are several long term postoperative complications that the patient may suffer. One year after CABG surgery, lung function declines and 30% of patients suffer from chronic chest pain. Living with chronic pain can be stressful but one of the best ways to help patients reduce stress is to learn how to relax through deep breathing exercises [1].

Various kinds of modalities that physiotherapy has in overcoming problems that arise in patients with post-CABG surgery, one of which is: Deep Breathing Exercise is a non-invasive treatment to positively affect cardiac autonomic function, depression, anxiety, high blood pressure,



and lung disease. Deep Breathing Exercise has been shown to balance body and brain function, and the function of the parasympathetic sympathetic system, thus it is considered an excellent modality to facilitate relaxation [2].

### **Case Presentation**

A 55 year old male dentist came to Dr. Sardjito Yogyakarta to undergo CABG (Coronary Artery Bypass Graft) surgery, after undergoing surgery the patient complained of pain in the incision marks on his chest. Patients describe pain as having an intensity of up to 5 out of ten accompanied by a feeling of tension in the right shoulder. The patient said that the pain in the chest had been experienced for the past year, the pain got worse when the patient felt tired, then the patient went to Dr. RSUP. Sardjito underwent angiography and found CAD2VD with LAD proximal mid CTO and 80% stenosis, the patient had a history of type 2 diabetes mellitus, and previously there was no family history of the same thing. The researcher stated that there was an incised wound on the patient's sternum, using an IV, normal chest shape, The chest looks symmetrical, the breathing pattern is normal, and there is swelling in the patient's right leg due to taking a blood vessel grafted to the coronary artery. When the researcher palpated, there was tenderness in the upper trapezius and pectoralis major, and pain in the sternum when the patient coughed and sneezed. On examination of basic movements the patient has no limitation of movement, only in the spasm due to pain. Blood pressure 82/50. SpO2 97%. On examination of basic movements the patient has no limitation of movement, only in the spasm due to pain. Blood pressure 82/50. SpO2 97%. On examination of basic movements the patient has no limitation of movement, only in the spasm due to pain. Blood pressure 82/50. SpO2 97%.

### **Management and Outcome**

The measuring instrument used in the patient is NPRS (Numeric Pain Rating Scale) to measure the level of pain. The interpretation of the pain severity score is as follows: (0) no pain, (1-3) mild pain, (4-6) moderate pain, (7-10) very painful [15]. NPRS has a high test retest reliability  $r = 0.96$  [4].

Patients are given therapy in the form of deep breathing exercises, instructed to position themselves in a comfortable position and asked to inhale through the nose for 2 seconds then hold for 3 seconds and then exhale slowly with pursed lips for 4 seconds and end by holding the breath for 3 seconds. Doing repetitions for 1 minute with a break of 2 seconds for each repetition, done 2 times a day [11].



## Result

Table 1. Pain using NPRS

| NRS         | T (beginning) | T (end) |
|-------------|---------------|---------|
| Tenderness  | 3             | 3       |
| Motion pain | 5             | 3       |

Based on the table above, the pain measured using NPRS obtained the results of tenderness in the incisor area T (initial): 3; motion pain in the incise area T (initial): 5; after being given therapy in the form of deep breathing exercise, there was a decrease in pain in the T (end) which became tenderness: 3 and motion pain in the incise area was worth 3.

## Discussion

Based on the results obtained, it was found that there was a decrease in motion pain as much as 2 points and there was no significant decrease in tenderness as measured using NPRS. according to [6]. The absolute risk of men is higher than that of women, but the relative risk of morbidity and mortality for women is higher. This result is supported by several authors who found that almost half of the study patients belonged to the dominant group of men aged 65 years or less [12]. Another researcher conducted in Egypt also reported that more than half of the patients were male, illiterate, and farmers. Their ages ranged from 50-59 years. Due to the medical background, diabetes is the patient's past medical history. Possible explanations are that there is a strong association between heart disease and hypertension, diabetes mellitus and smoking as potential causes. On the other hand, smoking, diabetes mellitus, hypertension, obesity, and low levels of vitamin C are major risk factors for heart disease [7].

Pain after CABG surgery is known to be the most serious complaint of patients. Although generally manageable, pain in up to 75% of patients often reports as moderate to severe pain. Pain can also persist postoperatively, with 35% of patients experiencing recurrent chest pain one year after cardiac surgery. Breathing becomes shallow and irregular when a person feels pain, due to increased tension in the respiratory muscles, which causes increased muscle tension and increased pain. This is related to the relaxation response that can relieve pain by educating the patient to be aware of this cycle, along with deep breathing exercises [13]. Several studies have stated that the beneficial effects of postoperative deep breathing exercise in patients undergoing cardiac surgery can increase relaxation, minimize pain and improve the patient's sleep quality [5]. Deep breathing exercise is one of the appropriate and cost-effective non-pharmacological methods that can be used to relieve pain which is implemented as part of a relaxation technique to reduce surgical pain [9].



Scientific evidence shows that deep breathing exercises can facilitate the transfer of oxygen to cells and reduce lung problems that may occur postoperatively [16].

## Conclusion

After doing physiotherapy in the case of Post Operation CABG (Coronary Artery Bypass Graft) using the Deep Breathing Exercise modality, the results showed a decrease in motion pain.

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