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Case Study

The Effectiveness of Cardio Rehabilitation Programs in Returning To Work Post-CABG or PCI In Coronary Heart Disease: Evidence-Based Case Report

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Abstract: In developing countries, coronary heart disease (CHD) is one of the primary sources of disease burden. Cardiovascular rehabilitation is primarily used to help people recover after Coronary Artery Bypass Graft (CABG) or Percutaneous Coronary Intervention (PCI) and improve their quality of life, but still underutilized by public. The literature search was conducted in May 2018 through PubMed and Google Scholar using Boolean Operators. The search strategy used only articles in English from any years. The desired studies are randomized control trial, cohort, and systematic review. From one selected systematic review found that combined cardiac rehabilitation, physical conditioning with counseling and risk factor education, of cardiac rehabilitation programs are more effective than usual care. Combined cardiac rehabilitation programs may improve the rate of short-term return to work (RR 1.56, 95% CI 1.23-1.98; I2=20%; low certainty evidence). Combined cardiac rehabilitation probably reduce the average time needed to return to work (moderate-certainty evidence) by about 40 days when compared to receiving usual care. Combined cardiac rehabilitation is probably better than standar care in shorten rest time before return to work in post CABG or PCI patients.

Keywords: Coronary heart disease, CABG, PCI, Cardio Rehabilitation Program, return to work

1. Introduction

Coronary heart disease (CHD) is one of the leading causes of disease burden in developing countries also the first cause of death in developed countries. Most low and middle income countries are experiencing a significant growth in CHD as a result of socioeconomic changes, lifestyle-related risk factors, and increased life expectancy (Gaziano et al., 2010). High blood pressure, cholesterol, diabetes, obesity, and cigarette use are the key contributors to the burden of CHD in Indonesia. Because of the pattern of growing risk factors over time, Indonesia's CHD burden is projected to rise even higher (Chow et al., 2017; Falk et al., 1995).

Atherosclerotic cardiovascular disease (ASCVD) can induce acute myocardial infarction (AMI) by restricting blood supply to the heart (Ngo-Metzger et al., 2018). Acute myocardial infarction (AMI) is one of the five primary symptoms of CHD, which is the leading cause of mortality and morbidity in industrialized countries. The prevalence of CHD in young people is increasing. Nearly half of all myocardial infarction patients are under the age of 65 and are in their working years (Mendis et al., 2011; Stendardo et al., 2018).

Although some CHD patients are treated with coronary angiography or coronary bypass surgery, others are just monitored with medication care. Some people have other chronic conditions that necessitate the administration of at least three drugs. This could have a negative impact on their careers and personal lives. As a result, employment ability and return to work after a diagnosis are crucial for population health and well-being (Şahan et al., 2016).

The main symptoms of heart disease are the same for workers and non-workers, These symptoms are chest discomfort, angina, or myocardial infarction in the acute stage, shortness of breath and weariness as

a result of heart failure, arrhythmia-induced loss of consciousness or transient aberration (Australian Heart Foundation, 2021; Price, 2004). Cardiovascular rehabilitation is mainly done for the purpose of recovering and bettering one's quality of life (Abdurachim et al., 2007). People, on the other hand, underutilize cardiovascular rehabilitation programs. The purpose of making this evidence-based case report (EBCR) is to find out the effectiveness of cardio rehabilitation programmes for workers returning to work.

2. Case Description

A 55-year-old man complained of shortness of breath for 2 months before hospitalized. Chest pain appears 1 week before being admitted to the hospital, slight nausea, heartburn, no vomiting, no cold sweat. Left chest pain radiates to the arm. Dyspneu on Effort (-), Paroxysmal Nocturnal Dyspneu (-), sleeps with 1-2 pillows, swollen feet (-). Fever (-). Patients previously from the puskesmas near his home and were told that he had symptoms of the heart disease and were sent to the Sumber Waras Hospital to be carried out a treadmill. From Sumber Waras Hospital, then they sent to the Harapan Kita Hospital. The patient's current job is a private`s driver in Jakarta. Patients currently undergoing Coronary artery bypass. The patient would like to return to work after his surgery and wonders how effectiveness of cardio rehabilitation program to help him return to work.

Clinical Question

How effective cardio rehabilitation program for workers with CHD in return to work with PICO description below:

P : Workers with CHD
I : Rehabilitation programme
C : Usual therapy / no intervention
O : Return to work

Methods

Literature search was carried out to answer the problem by using a database electronics from PubMed, and Goggle Schoolar. The keywords that were chosen were workers AND coronary heart disease (post CABG or PCI, or MI) and Rehabilitation. The inclusion criteria applied to this search strategy are RCTs, Cohort, Systematic review, workers with coronary heart disease, Cardio rehabilitation Programme and return to work. The exclusion criteria applied were in accessible articles, articles are not in English, statistical data values are not available (Figure 1). Literature search was conducted on 18th May 2018.

3. Result and Discussion

Based on the literature search, 1 systematic review was obtained and analyzed using the criteria by the Oxford Center for Evidence based medicine, the results obtained were qualified for use. The qualities of studies are of good quality; nevertheless, after aggregating them according to intervention type and follow-up times, the maximum number of studies that could be aggregated was 10. Furthermore, studies rarely included information on the employment characteristics of research participants previous to CHD (i.e.how many participants worked in physically strenuous occupations). Some studies also found that the desire to return to work reduced compliance with rehabilitation programs; however, withdrawals during the interventions should not have influenced the findings in studies that used intention-to-treat analyses and considered intention-to-treat in 'Risk of bias' assessments. With appropriate summary tables and charts, the results have been summarized. Analyses were stratified by length of follow-up and conducted subgroup analyses to see how the study populations' gender, physically demanding occupational groups, and CHD severity influenced the impact of the therapies. In future updates of this review, if there are enough trials, they will conduct meta-regression analyses (using Stata® software) to relate the following study

characteristics to their sizes of effect: study population (age, gender, country), length of follow-up, study date; and physically demanding occupational groups, or alternatively.

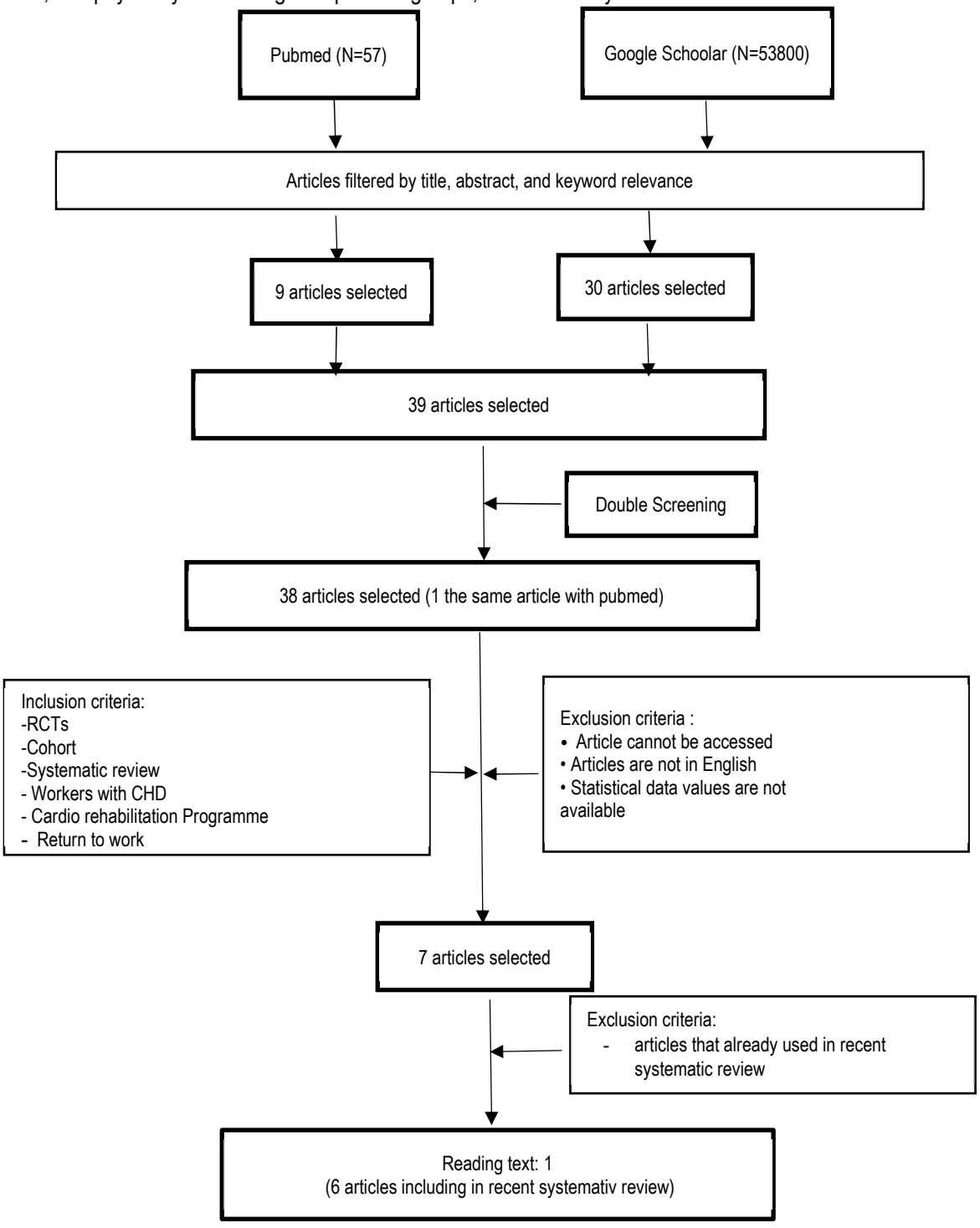

Figure 1. Literature searching chart

The Chi2 test and the I2 statistic were used to measure statistical heterogeneity, with a significance level of P = 0.1 (due to the low power of the test in most meta-analyses). "0 percent to 40 percent: might not be important; 30 percent to 60 percent: may represent moderate heterogeneity; 50 percent to 90 percent: may represent substantial heterogeneity; 75 percent to 100 percent: considerable heterogeneity," according

to the Cochrane Handbook for Systematic Reviews of Interventions.

This Cochrane systematic review comprised 39 RCTs with a total of 5944 participants that looked at interventions to help persons with CHD return to work. They used 13 studies in the meta-analysis for short duration (less than six months), medium term (six months to one year), and mean days until return to work (Hegewald et al., 2019; John Hopkins Hospital, 2019).

All interventions in the following categories that attempt to promote the return-to-work process with individual or group methods were investigated in this systematic review (Hegewald et al., 2019). First category intervention was work-directed interventions such as a stepwise occupational reintegration (SOR) program, they can involve modifications to the work environment, work tasks, or working practices, second intervention program were interventions that are targeted towards a specific individual including psychological interventions counseling and health education; screening and treatment of comorbid psychological problems; stress management and relaxation training; social support; gender-specific interventions carried out by any certified practitioner (e.g. psychologist), including physical conditioning interventions that any supervised or unsupervised inpatient, outpatient, community- or home-based intervention that includes some sort of physical training or physical exercises for a cardiac rehabilitation patient group. The the third category was any of the preceding in combination. They included trials with a control group that received no treatment, i.e., standard care (as described in study reports). Only studies in which both the intervention and control groups received the identical pharmacotherapeutic or nutritional therapy were included.

If we compared cardio rehabilitation program in Indonesia, there were phase I, with a few phase II programs thrown in for good measure. The first day of a patient's hospital admission, such as mobilization, begins Phase I CR (physical intervention). All patients with CAD can benefit from Phase II CR, which is a multidisciplinary program that requires a set of knowledge and skills to bring together medical therapy, risk factor control, education, exercise training, and counseling (Physical and physicological intervention). But not all following phase 2. This program similar the second program from the literature that includes intervention psychologists beside physical intervention (Dwiputra et al., 2017). In other literature mentioned, in its implementation, the cardiac rehabilitation program in Indonesia is grouped into several phases: Phase I is an effort that is immediately carried out while the patient is still in treatment. carry out daily activities independently and safely. Phase II, which is carried out immediately after the patient is discharged from the hospital, is an intervention program to restore the patient's function as optimally as possible, immediately control risk factors, and provide education and additional counseling regarding a healthy lifestyle. Phases III and IV are the maintenance phases, where it is hoped that the patient will be able to carry out a rehabilitation program independently, safely, and maintain a healthy lifestyle forever, assisted or together with his family and surrounding community (Basuni et al., 2009). However from the literature in Indonesia not all patient following pysicological counseling in Indonesia.

According to this systematic review, combination therapies are more effective than standard care. In the meta-analysis, they looked at 13 studies that looked at combined (complete) cardiac rehabilitation programs that included both counseling and physical activity (Hegewald et al., 2019). Following a comprehensive cardiac rehabilitation program, four trials found a rate of return to work of up to six months. Combined cardiac rehabilitation programs may improve the rate of short-term return to work (RR 1.56, 95 percent CI 1.23 to 1.98; I2 = 20%; low certainty evidence). This translates to number needed to treat for an additional beneficial outcome (NNTB) of 5, which means that for every five patients undergoing combined cardiac rehabilitation, one additional person will return to work up to six months following their CHD hospitalization (Hegewald et al., 2019). Many patients require this therapy because, for the most part, patients with CHD after CABG or PCI they require physicological interventions, because they were concerned about having another heart attack or not being able to work again, which created a barrier for

them to return to work (Torpy et al., 2004).

Following a combination of therapies, ten studies demonstrated a return to work in the medium term (six months to one year). This combining interventions may have little or no effect on the medium-term return-to-work rate (RR 1.06, 95 percent CI 1.00 to 1.13; I2 = 0%; poor certainty evidence) (Brigham, 2011; Hegewald et al., 2019). The study do not know whether combining cardiac rehabilitation programs increases participants' long-term (one to five years) or extended long-term (five or more years) employment rates following hospitalization (very low-certainty evidence). When compared to getting normal treatment, combined interventions definitely cut the average time required to return to work by roughly 40 days (moderate certainty evidence). Combination therapies may have little to no effect on health-related quality of life and almost certainly have little to no effect on adverse effects (measured as reinfarctions).

From this study, it is also known that there were no research workers with CHD who received work-directed program interventions upon returning to work. This is a very broad research opportunity for occupational medicine specialists and for assessing the program.

4. Conclusion

Cardiovascular rehabilitation that includes both physical and psychological aspects may help people return to work six months after a heart attack (CHD). This translates to an NNTB of 5, which means that for every five patients undergoing combined cardiac rehabilitation, one additional person will return to work up to six months following their CHD hospitalization. When compared to standard treatment, combined therapies are likely to cut the time it takes to return to work by roughly 40 days (moderate certainty evidence). Cardiac rehabilitation that included both physical and psychological aspects was shown to be more successful than standard therapy.

Following CHD hospitalization, workers with CHD may be eligible for combined cardiac rehabilitation. People who had been hospitalized for a MI were mostly studied, with CABG or PCI procedures being less frequently examined. This could suggest that the findings are less relevant to patients undergoing revascularization surgery. Need more studies about the effectiveness of cardio rehabilitation program for workers with CHD after CABG or PCI and need more studies about the effectiveness of work directed programs, because none of the studies looked at the effectiveness of work-directed programs, and others only looked at work-directed interventions such stepwise occupational reintegration (SOR).

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