



## Relationship between Cardiac Rehabilitation and High Sensitivity C-Reactive Protein in Patients undergoing Coronary Artery Bypass Graft Surgery

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**Abstract : Background** : Coronary heart disease (CHD), a gradual chronic inflammatory disease, is influenced by the environmental, lifestyle, and genetic factors that can be seen from traditional risk factors, inflammatory biomarkers, and metabolic status. Inflammatory biomarkers that were currently being studied include high sensitivity C-reactive protein (hsCRP), interleukin-6 (IL-6), tumor necrosis factor alpha (TNF- $\alpha$ ), and intercellular adhesion molecule-1 (ICAM-1). Increased hsCRP is an independent risk factor that is important for CHD and determines the prognosis in patients who have CHD. Cardiac rehabilitation has a role in improving risk factors and preventing a variety of advanced cardiovascular events. This study aims to find the relationship of cardiac rehabilitation programs to hsCRP values in patients with CHD who have undergone coronary artery bypass grafting (CABG). **Methods** : This study was conducted from April 2018 - September 2018 with a total sample of 67 patients underwent phase II cardiac rehabilitation programs following CABG that met the inclusion and exclusion criteria. The hsCRP laboratory examination was conducted by the Clinical Pathology Laboratory of Haji Adam Malik General Hospital in two measurement periods, before and after the phase II cardiac rehabilitation program. And then the data was analyzed to see the relationship between cardiac rehabilitation and hsCRP value. **Results**: The total subjects of this study were 67 people that can be classified into two groups, high risk group (hsCRP >3 mg/dL) 15 people (22.38%) and medium risk group (hsCRP 1-3 mg/dL) 52 people (77.61%). Statistically significant improvements were found with  $p < 0.05$  in various parameters such as: body weight, body mass index (BMI), waist circumference, six minutes walk distance (6MWD), functional capacity, hsCRP value, total cholesterol, LDL, HDL, and TG. Negative correlation was obtained between hsCRP value and functional capacity before the program with  $r -0.689$  and  $p < 0.05$ . A negative correlation was found between hsCRP value and functional capacity after the program with  $r -0.819$  and  $p < 0.05$ . **Conclusion** : There was a relationship between cardiac rehabilitation and hsCRP in patients undergoing CABG. A significant decrease of hsCRP value was found in this study. Cardiac rehabilitation program not only improved laboratory components such as hsCRP and lipid profile, but also improved other metabolic parameters such as weight, BMI, waist circumference, and also improved the 6MWD and exercise capacity of patients after CABG. There was a statistically significant negative correlation between hsCRP values and functional capacity both before and after the rehabilitation program.

**Keywords** : cardiac rehabilitation, hsCRP, CABG, CHD.

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