Comparative Effectiveness of Cardiovascular Procedures in Pneumoconiosis Patients

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Pneumoconiosis is a major occupational disease that develops as a result of occupational exposure to dust via inhalation. Most pneumoconioses share some common pathophysiological mechanisms that include excessive development of fibrous (i.e., scar) tissue in the lungs – pneumofibrosis – that restricts respiratory lung capacity. In addition to its harmful effect on respiratory system, pneumoconiosis can increase vulnerability to coronary heart disease (CHD) – the leading cause of death in the U.S. and in the world. The long-term goal of the proposed study is to improve cardiovascular healthcare needs of the pneumoconiosis population. Currently, two types of cardiovascular intervention procedures for CHD treatment are percutaneous coronary intervention (PCI) and coronary artery bypass grafting (CABG). The Agency for Healthcare Research and Quality points out that comparative effectiveness of PCI and CABG in patients with coexisting (comorbid) conditions remains an open question and needs to be investigated. The objective of this application is to investigate comparative effectiveness of the two major cardiovascular intervention procedures – PCI and CABG – in pneumoconiosis patients with CHD. The central hypothesis of this application is that in pneumoconiosis patients with coronary heart disease, percutaneous coronary intervention is (a) at least as safe as coronary artery bypass grafting; and, (b) more resource-effective than coronary artery bypass grafting. The specific aims of the study are: (1) compare post-PCI vs. post-CABG in-hospital mortality in pneumoconiosis patients with CHD, after adjusting for patient-related and hospital-related covariates; (2) investigate length of stay difference between percutaneous coronary intervention and coronary artery bypass grafting in pneumoconiosis patients with coronary heart disease, after adjusting for patient-related and hospital-related covariates; and, (3) investigate PCI-CABG cost-of-hospitalization difference in pneumoconiosis patients with CHD, after adjusting for patient-related and hospital-related covariates. This will be the first comparative effectiveness study comparing percutaneous coronary intervention and coronary artery bypass graft in patients diagnosed with pneumoconiosis.

This study has the potential to impact evidence-based clinical interventions that will improve cardiovascular health care of the individuals suffering from the debilitating effects of pneumoconiosis. Based on the study results, the most effective intervention strategies for improving cardiovascular healthcare needs of the pneumoconiosis population will be established.

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