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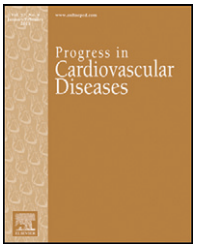

Effect of Socioeconomic Status on Propensity to Change Risk Behaviors Following Myocardial Infarction: Implications for Healthy Lifestyle Medicine

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ABSTRACT

Failure to change risk behaviors following myocardial infarction (MI) increases the likelihood of recurrent MI and death. Lower-socioeconomic status (SES) patients are more likely to engage in high-risk behaviors prior to MI. Less well known is whether propensity to change risk behaviors after MI also varies inversely with SES. We performed a systematized literature review addressing changes in risk behaviors following MI as a function of SES. 2160 abstracts were reviewed and 44 met eligibility criteria. Behaviors included smoking cessation, cardiac rehabilitation (CR), medication adherence, diet, and physical activity (PA). For each behavior, lower-SES patients were less likely to change after MI. Overall, lower-SES patients were 2 to 4 times less likely to make needed behavior changes (OR's 0.25–0.56). Lower-SES populations are less successful at changing risk behaviors post-MI. Increasing their participation in CR/secondary prevention programs, which address multiple risk behaviors, including increasing PA and exercise, should be a priority of healthy lifestyle medicine (HLM).

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Abbreviations and Acronyms
CR = cardiac rehabilitation
CV = cardiovascular
CVD = cardiovascular disease
HLM = healthy lifestyle medicine
MI = myocardial infarction
PA = physical activity
SES = socioeconomic status

Coronary heart disease is the leading cause of death in the United States, accounting for roughly 14% of deaths annually. An estimated 750,000 Americans experience a myocardial infarction (MI) each year.[1] Rehospitalizations after an initial cardiovascular (CV) disease (CVD) event are also a major concern, as there are more than 200,000 recurrent MIs each year.[1] In one study 30% of those hospitalized for an MI were readmitted within 90 days.[2]

Behavior change following an MI is critical for addressing the risk of future morbidity and mortality. Risk of reinfarction, as well as other sources of morbidity and mortality, can be significantly reduced through adherence to secondary prevention guidelines that include the modification of lifestyle behaviors such as smoking cessation,[3] improving diet,[4,5] increasing moderate physical activity (PA),[6] adhering to prescribed medications,[7] and attending cardiac rehabilitation (CR).[8] Attendance at CR is particularly important as at CR patients receive counseling and support to alter a host of behavioral risk factors.[9]

Certain vulnerable populations are at a particularly increased risk for developing CVD. One such at-risk population is patients with lower-socioeconomic status (SES), which has a long history of strong associations with CV health[10] and continues to be a robust predictor of MI incidence[11,12] even at the level of countries.[13,14]

SES is also a strong predictor of morbidity and mortality following an MI. Multiple studies have found that morbidity and mortality rates following MI are higher among those with lower SES,[15–19] which is also predictive of progression of CVD, severity of MI presentation, and mortality.[20–21] Associations between SES and mortality following MI persist even in countries with universal healthcare.[18] Similarly, within the Medicare population (where you would assume equity of medical care) lower-SES patients have higher rates of mortality than higher-SES patients.[22–23]

This association between lower SES and poor post-MI outcomes is not well explained by access to healthcare and is thought to be more related to behavioral risk-factor patterns.[24] Lower-SES patients have behavioral profiles consistent with a higher risk of incident and recurrent MI, as lower-SES patients are more likely to smoke, engage in low levels of PA, have poor blood pressure, type 2 diabetes mellitus, or lipid control, have higher body mass indices, and consume more fat and fewer fruits and vegetables than their higher-SES counterparts.[17,25–28] It is estimated that controlling these potentially modifiable risk factors could address up to 80–90% of the risk for initial MI.[29,30] These risky behaviors not only predict development of CVD but also subsequent morbidity and mortality after its onset. Indeed, studies that have examined these relationships have demonstrated that most of the discrepancy in cardiovascular morbidity and mortality between lower- and higher-SES populations can be explained by the higher risk profiles of lower-SES patients.[15–17,27,28,31] For example, morbidity risk drops from a hazard ratio of 2.68 to 1.52 after adjusting for behavioral risk-factors[17] while mortality rates of 5.1% vs. 1.9% are no longer significantly different after a similar adjustment.[31] In essence, it is not SES that is responsible for morbidity and mortality disparities, it is the behavioral risk factors associated with SES that drive health outcome disparities.

Assuming that lower-SES patients are higher risk for CVD given their relatively high rates of risk behaviors (smoking, sedentary lifestyles, etc.), an additional important determinant of future morbidity and mortality risk is how lower-SES patients respond to the necessity of making behavioral changes after experiencing an MI. Other researchers have demonstrated that, in general, lower-SES populations are "vulnerable" to life event challenges and may respond differently to such events (e.g., McLeod[32]). If lower-SES populations are less likely to change their behavior in response to major health challenges than higher-SES populations, we would expect to see that health disparities by SES would actually increase over time (Fig 1). Indeed, there is some evidence to support this view as studies modeling disparities over time show that the discrepancy in health between lower- and higher-SES populations increase as the population ages and accumulates more health challenges (e.g., Prus[33]). If indeed lower-SES cardiac patients are struggling to change risk behaviors following a major health event, like an MI, a preventive approach such as healthy lifestyle medicine (HLM) would suggest increased efforts to engage these patients in secondary prevention programs, such as CR.[34]

Given that risk behaviors account for much of morbidity and mortality following a CVD event, changing behavioral risk factors to align with secondary prevention guidelines should significantly attenuate future risk. However, if lower-SES patients are less likely to make the needed behavior changes following an MI, this could help explain the sustained and diverging disparities in health outcomes seen by SES. The goal of this review is to help inform HLM by examining the extent to which behavior change following an MI, as measured by changes to risk behaviors, varies as a function of SES.

Methods

A systemized literature review was conducted using PubMed, PsychInfo, and Web of Science to identify articles potentially relevant to the relationship between SES and post-MI behavior change. SES is defined in a variety of ways in the literature and thus search terms were included to encompass a diversity of definitions such as income, insurance type, and educational attainment. The following search string was used: (((myocardial infarction) AND (deprivation OR SES OR poverty OR neighborhood OR high school OR Medicaid OR socioeconomic status OR education OR income)) AND (behavior OR smoking OR cardiac rehabilitation OR fitness change OR physical activity OR medication adherence OR diet change))). Articles had to be published by July 1, 2016. Abstracts were reviewed independently by two of the authors

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