Effort-Reward Imbalance at Work and Recurrent Coronary Heart Disease Events: A 4-Year Prospective Study of Post–Myocardial Infarction Patients

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Objective: Prospective studies have shown that effort-reward imbalance (ERI) at work is associated with the incidence of a first coronary heart disease (CHD) event. However, it is unknown whether ERI at work increases the risk of recurrent CHD events. The objective of this study was to determine whether ERI at work and its components (effort and reward) increase the risk of recurrent CHD in post–myocardial infarction (post-MI) workers. **Methods:** We carried out a prospective cohort study of 669 men and 69 women who returned to work after a first MI. ERI at work was assessed by telephone interview using validated scales of reward and psychological demands. The outcome was a composite of fatal CHD, nonfatal MI, and unstable angina. CHD risk factors were documented in medical files and by interview. The participants were followed up for a mean period of 4.0 years (1998–2005). **Results:** During the follow-up, 96 CHD events were documented. High ERI and low reward were associated with recurrent CHD (respective adjusted hazard ratios [HRs] = 1.75, 95% confidence interval [CI] = 0.99–3.08, and HR = 1.77, 95% CI = 1.16–2.71). There was a gender interaction showing stronger effects among women (respective adjusted HRs for high ERI and low reward: HR = 3.95, 95% CI = 0.93–16.79, and HR = 9.53, 95% CI = 1.15–78.68). **Conclusions:** Post-MI workers holding jobs that involved ERI or low reward had increased risk of recurrent CHD. **Key words:** coronary heart disease, effort-reward imbalance, post–myocardial infarction, prevention, psychosocial work environment, risk factors.

BMI = body mass index; **CHD** = coronary heart disease; **CI** = confidence interval; **ERI** = effort-reward imbalance; **HR** = hazard ratio; **MI** = myocardial infarction.

INTRODUCTION

Psychosocial work environment has been assessed mostly with two theoretical models: job strain and effort-reward imbalance (ERI). The job strain model developed by Karasek (1) posits that a combination of high psychological demands (refers to the quantity of work, intellectual requirements, and time constraints) and low decision latitude (refers to the possibility of making decision, being creative, and using and developing one's abilities) is a health risk for workers. The ERI model developed by Siegrist (2) emphasizes that a perceived imbalance between high effort spent at work and low reward may elicit sustained stress reactions with adverse consequences for health. Two different sources of effort at work have been defined in this model, namely, extrinsic and intrinsic (3). The extrinsic source of effort is close to the psychological demands concept of the Karasek model and refers to time pressure, frequent interruptions, numerous responsibilities, increased workload, and mandatory overtime (4). Reward refers to respect and esteem, money, and career opportunities including job security. The notion of balance between effort and reward had its theoretical basis in the notion of social reciprocity, which is an expectation for all humans (5,6). A second source of effort usually called "overcommitment" is an intrinsic psychological pattern of coping associated with the inability to withdraw from work obligations (4). According to the theoretical ERI model, overcommitment is assumed to modify (i.e., increase) the deleterious effect of ERI on health.

The effort component of the ERI model overlaps with the psychological demands component of the job strain model inasmuch as they both measure quantitative and qualitative workload. However, the ERI model clearly differs from the job strain model because the reward component is central to the ERI model, whereas it is absent from the job strain model.

Three previous prospective studies have evaluated the effect of ERI at work on the incidence of new coronary heart disease (CHD) events (7–9). Relative risks (RRs) observed were 1.26 (95% confidence interval [CI] = 1.03–1.55) (8), 2.42 (95% CI = 1.2–5.73) (9), and 4.53 (95% CI = 1.43–14.3) (7). These studies all had a prospective design and validated instruments to measure ERI. Furthermore, Kuper et al. (8) and Kivimaki et al. (9) had a large sample composed of both men and women and a high participation rate. However, generalization was limited in Siegrist et al. (7) by a lack of precision shown by large CIs. Although these previous studies have shown that exposure to ERI was associated with a higher incidence of a first CHD in workers who are initially free of the disease, the effect of ERI on recurrent CHD has not yet been evaluated. More specifically, it is unknown whether ERI at work increases the risk of recurrence in patients who returned to work after a first myocardial infarction (MI). It is possible that the work conditions of persons who have had an MI differ from that of other workers because of work organization change or job change after MI. The aim of the present study was to determine whether ERI at work and its components (effort and reward) increase the risk of recurrent CHD in post-MI workers.

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