Ischaemic heart disease - risk assessment, diagnosis, and secondary preventive treatment in primary care, with special reference to the relevance of exercise ECG

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Akademisk avhandling

som med vederbörligt tillstånd av Rektor vid Umeå universitet för avläggande av medicine doktorsexamen framläggs till offentligt försvar i Sal 135, byggnad 9A, fredagen den 18 mars, kl. 13:00. Avhandlingen kommer att försvaras på svenska.

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Abstract

Background: Ischaemic heart disease is a diagnostic and therapeutic challenge to most general practitioners. We sought to identify diagnostic characteristics and prognoses of patients in primary care who underwent exercise electrocardiography (ECG). We compared the ECG test results with respect to the probability of subsequent cardiologist referrals. We also aimed to identify determinants for prehospital delays and lack of statin treatment before a first-time myocardial infarction (MI).

Methods: Setting: Region of Jämtland Härjedalen, Sweden (adult population, approximately 99 000); study period 2010–2014. Patients and study designs: Studies I and II – 865 patients referred to exercise ECG; primary outcome – incidence of cardiovascular events (I) and cardiologist referrals within 6 months after exercise ECG (II); observed outcomes were compared to predictions from multivariable logistic models. Study III – 265 patients with first-time MI; characteristics were analysed for determinants of prehospital delay ≥2 hours. Study IV – survey of 931 patients with first-time MI; analyses of characteristics associated with rates of statin treatment in patients with previously diagnosed cardiovascular disease (CVD).

Results: Study I: Exercise test results were associated with exertional chest pain, a pathologic ST-T segment on resting ECG, angina diagnosis according to the patient’s report, and medication for dyslipidaemia. Cardiovascular events occurred in 52.7%, 18.3%, and 2.0% of patients with positive (ST-segment depression >1 mm and chest pain indicative of angina), inconclusive (ST depression or chest pain), or negative tests, respectively. Study II: Positive or inconclusive exercise tests were associated with cardiologist referrals. Among patients with positive exercise tests, referral rates decreased with age, after adjusting for co-morbidity. Self-employed women were referred to cardiologic evaluations more often than other employed women. Study III: The first medical contact was a primary care facility for 52.3% of patients. The prehospital delay time was ≥2 h for 67.0% of patients in primary care and 44.7% of patients who called emergency medical services or were self-referred to the hospital. Study IV: Among patients with prior CVD, 34.5% received current statin treatment before the first MI. Statin treatment rates decreased with age, after adjusting for CVD and diabetes; women ≥70 years old were treated half as often as men of the same age.

Conclusions: Clinical characteristics can be used to identify patients at low risk for cardiac events. The prognosis in patients with a negative exercise ECG was benign for 6 months after the exercise ECG. Exercise tests are important for selecting patients who require cardiologic evaluations. Age, gender, and employment status interacted with rates of referrals for cardiac evaluation. The prehospital delay time was considerably prolonged, particularly when primary care was the first medical contact. Only one third of patients with a prior CVD received statin treatment. Pre-MI statin treatment decreased with age, particularly among women ≥70 years old. In making medical decisions, it is necessary to be aware of biases regarding age, gender, and socioeconomic status. Methodologies for case-finding and follow-up need to be improved and implemented in clinical practice.

Keywords: Exercise ECG, Ischaemic heart disease, Myocardial infarction, Prehospital delay, Primary care, Prognosis, Referral, Statin, Secondary prevention