

WOMEN VERSUS MEN WITH MYOCARDIAL INFARCTION.**Sex differences in risk factors, management and outcome**

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ABSTRACT

Although coronary heart disease (CHD) is more common in men, it is also a major cause of morbidity and death in women. The present series of studies was initiated to explore in detail aspects on risk factors, clinical presentation, diagnosis, management and outcome of coronary heart disease in women, applying a population perspective.

The studies were performed within the framework of the WHO MONICA Project, a multinational study of trends and determinants of cardiovascular disease. Norrbotten and Västerbotten counties in northern Sweden together constitute one of the MONICA centers. Fatal and non-fatal coronary events in the age group 25-64 years have been monitored since 1985 and population surveys of cardiovascular risk factors were performed in randomly selected samples of men and women in 1986, 1990 and 1994.

The prevalence of use of oral contraceptives (OC) and hormone replacement therapy after menopause (HRT) was compared in 32 MONICA centers. The use of OC in premenopausal women varied between 0 and 52% and the use of HRT varied between 0 and 56%. With some notable (and unexplained) exceptions, hormone use followed a socioeconomic pattern with a higher prevalence in affluent countries.

The relationships between use of female sex hormones and fibrinogen and fibrinolysis were investigated in northern Sweden. Both OC and HRT users had a favorable pattern in fibrinolytic variables as compared with non-users. However, after adjustment for possible confounders (mainly lifestyle factors), most of the differences between users and non-users of HRT were abolished.

Diabetes was found to confer a much higher relative risk for acute myocardial infarction (AMI) among women as compared with men (relative risk 5.0 vs. 2.9). Diabetic subjects of both sexes also had a higher 28-day case fatality (CF) than non-diabetics had. In ages up to 65 years, the overall mortality from AMI was 4-fold higher in diabetic vs. non-diabetic men and as much as 7-fold higher in diabetic women.

Women had significantly higher in-hospital CF than men (21.1% vs. 12.6%; $p < 0.0001$), but this was counterbalanced by a higher out-of-hospital CF in men. On admission to hospital, more men than women with AMI had typical chest pain and typical ECG changes ($p < 0.0001$ for both). Significantly larger proportions of men were admitted in the coronary care unit and treated with thrombolysis.

In men, both short-term and long-term survival after AMI has improved markedly since 1985. During the same period, the survival in women with AMI has been unchanged. The sex difference was not explained by differences in conventional prognostic factors but a higher prevalence of diabetes among women and a lower proportion of women being discharged from hospital with effective secondary prevention (antiplatelet agents and beta blockers) may have contributed.

To conclude, there are major differences between men and women in diagnosis, management and outcome of myocardial infarction. Diabetes is even more important as a risk factor for AMI in women than in men. The apparent beneficial effects of HRT on fibrinolytic activity are largely explained by a favorable cardiovascular risk factor profile in HRT users.

Keywords: Acute myocardial infarction, case fatality, prognosis, cardiovascular disease, oral contraceptives, hormone replacement therapy, diabetes, fibrinolysis, time trends, WHO MONICA