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# Estimating the heritability of survival time after acute myocardial infarction using population-based national Swedish health registries

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**Abstract**

Acute myocardial infarction (AMI) is the most common cause of death in Sweden. The aim of this study was to assess the heritability of survival time after acute myocardial infarction in full siblings. The study was based on reported incidents of Acute Myocardial Infarction in Sweden between 1987 and 2006 to either the National Patient Register or the Cause of Death register. We used the Multigenerational register to identify full sibling pairs where both had suffered from AMI. In this study we are focusing on the nonimmediate deaths (i.e. patients surviving the first day after AMI). Three different outcomes were studied: overall mortality, cause-specific death and repeated AMI. For each different outcome a Cox proportional hazards model was fit to the whole population (second sibling in each sib-pair to suffer from AMI excluded), taken into account possible confounders i.e. age, sex, calendar year and county. These models served as adjusted baseline for average survival after an AMI event, from which we computed residuals for all the members of sib pairs that we were interested in. These residuals served as a quantitative, adjusted measure of prognosis, i.e. better or worse than expected for the given combination of age, sex etc. We then fitted a Cox proportional hazards model based on the second sibling in each sib-pair to suffer from AMI, using the first sibling's prognosis as exposure. For the outcome overall mortality the results indicate that there is an association between full siblings survival time but for the other two outcomes there is no evidence of association between full siblings survival times. This result indicates that the co-morbidity that we see for the outcome overall mortality can be due to shared frailties rather than a direct consequence of the AMI event.

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