

Change in heart rate over time predicts mortality

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In November 2008, was published the study that assessed the prognostic value of a change in heart rate (HR) over a number of years. The investigators have found that there is a relation between this variable and mortality. They found that in a group of healthy policemen, rest HR and its change over five years were both predictors of death, independent of the standard cardiovascular risk factors. Those whose HR rose by more than three beats per minute (bpm) over this time period had an almost 20% increased mortality risk compared with men whose HR remained unchanged. Furthermore, reduced HR was associated with 14% lower risk of death.

This was an observational, prospective study that followed 5,139 asymptomatic men (aged 42 to 53 years) who were recruited from 1967 to 1972 and had their HRs measured at rest in standardized conditions every year for five consecutive years. HR change was defined as the difference between HR at examination 5 and HR at inclusion. Subjects were divided into the following tertiles: decrease >4 bpm; unchanged (from -4 to $+3$ bpm); or increase >3 bpm. After adjustments were made for confounding factors, including baseline HR at rest, compared with subjects with unchanged HRs, those with decreased HRs during the five years had a 14% decreased mortality risk (RR

0.86, 95% CI 0.74-1.00; $p=0.05$), whereas men with increased HRs during the five years had a 19% increased mortality risk (RR 1.19, 95% CI 1.04-1.37; $p<0.012$).

Should be notice that the study was performed in relatively young French policemen, therefore the applicability of the findings to women or a more unselected or recent population cohort is unclear. But the investigators said that the association between high HR at rest and mortality is consistent with data already published in a number of epidemiologic studies and that high HR at rest could reflect underlying abnormalities, possibly via increased mechanical stress on the arterial wall and heart. They noticed that the most common reason for a slow heart rate in young to middle-aged subjects, such as in the present study, is regular conditioning. Consequently, subjects in this group were the ones who exercised regularly and continued to exercise regularly throughout the five-year period. As expected, body-mass index BMI was lowest in this group.

The present study is unique in that it shows that patients whose heart rate increased during a five-year period had an increased mortality risk. Further interventional trials are needed to prove an association between HR decrease determining by regular exercise and a decrease in mortality risk.

Comment on the paper:

Jouven X, Empana JP, Escolano S, et al – Relation of heart rate at rest and long-term (>20 years) death rate in initially healthy middle-aged men. *Am J Cardiol* 2008; Available at: <http://www.ajconline.org>.