Abstract


Glutathione peroxidase 1 activity and cardiovascular events in patients with coronary artery disease.


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BACKGROUND: Cellular antioxidant enzymes such as glutathione peroxidase 1 and superoxide dismutase have a central role in the control of reactive oxygen species. In vitro data and studies in animal models suggest that these enzymes may protect against atherosclerosis, but little is known about their relevance to human disease.

METHODS: We conducted a prospective study among 636 patients with suspected coronary artery disease, with a median follow-up period of 4.7 years (maximum, 5.4) to assess the risk of cardiovascular events associated with base-line erythrocyte glutathione peroxidase 1 and superoxide dismutase activity.

RESULTS: Glutathione peroxidase 1 activity was among the strongest univariate predictors of the risk of cardiovascular events, whereas superoxide dismutase activity had no association with risk. The risk of cardiovascular events was inversely associated with increasing quartiles of glutathione peroxidase 1 activity (P for trend <0.001); patients in the highest quartile of glutathione peroxidase 1 activity had a hazard ratio of 0.29 (95 percent confidence interval, 0.15 to 0.58; P<0.001), as compared with those in the lowest quartile. Glutathione peroxidase 1 activity was affected by sex and smoking status but retained its predictive power in these subgroups. After adjustment for these and other cardiovascular risk factors, the inverse association between glutathione peroxidase 1 activity and cardiovascular events remained nearly unchanged.

CONCLUSIONS: In patients with coronary artery disease, a low level of activity of red-cell glutathione peroxidase 1 is independently associated with an increased risk of cardiovascular events. Glutathione peroxidase 1 activity may have prognostic value in addition to that of traditional risk factors. Furthermore, increasing glutathione peroxidase 1 activity might lower the risk of cardiovascular events.

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