

ABSTRACT

DIABETES AND HEART DISEASE IN MEN AND WOMEN

For some time now I have been pondering the general applicability of conventional risk factors for heart disease, given that most studies are on middle-aged, or older, American men, who already have multiple pathology. Some years ago I remember reading that cardiac stress testing was not a particularly sensitive measure of cardiac risk in women, but since then have seen little in the literature that attempts to do anything other than generalise risk factors from one specific population to everyone. So this paper in the *British Medical Journal* caught my eye when I noticed that the conclusion is that the relative risk for fatal coronary heart disease associated with type 2 diabetes is 50% higher in women than it is in men.

As Rachel Huxley, Federica Barzi and Mark Woodward point out, type 2 diabetes has long been known to be a risk factor for coronary heart disease and is conservatively estimated to double the risk of a fatal event. The association between diabetes and coronary heart disease has been suggested to be stronger in women than in men, suggesting that diabetes at least partially eliminates the advantages of being female as far as the risk of coronary heart disease is concerned. In the last 10 years, 3 meta-analyses of this topic have produced conflicting results. Two of the studies concluded that women with diabetes were at increased risk of mortality from coronary heart disease compared with men, while a third found no difference. The authors of this paper suggest that these discrepancies may have arisen from differences in the level of adjustment for other cardiovascular risk factors such as lipid levels, age and blood pressure. In this meta-analysis of prospective cohort studies, the authors used studies published between 1966 and March 2005. Studies were eligible if they reported estimates of the relative risk for fatal coronary heart disease comparing men and women with and without diabetes. The estimates must have been adjusted for at least age.

They found 37 studies of type 2 diabetes and fatal coronary heart disease among a total of 447 064 patients studied. These studies showed that, overall, the rate of fatal coronary heart disease was higher in patients with diabetes than in those without (5.4% versus 1.6%). They also showed that

the overall relative risk for fatal coronary heart disease in patients with diabetes compared with those without diabetes was significantly greater among women than it was among men. Hence the conclusion that women with type 2 diabetes have a 50% greater risk of fatal coronary heart disease than do men with the same disease. One of the more interesting questions is 'why?'. The authors contend that there may be several mechanisms that could explain this finding. Their analyses supported a supposition that diabetes may produce a more unfavourable cardiovascular risk profile among women. They found that women with diabetes not only have significantly higher levels of blood pressure and deranged lipids than do men with diabetes, but that the difference in these levels among people with and without diabetes was significantly greater in women than it was in men. So, women with type 2 diabetes may have totally different levels of cardiovascular risk to those in men.

An alternative hypothesis put forward in the paper is that women may not be treated as aggressively for coronary heart disease as men are. Recent studies have shown that men with diabetes or established cardiovascular disease are more likely to receive aspirin, statins or antihypertensive drugs than are women. So, it may also be that the more aggressive treatment of risk factors for coronary heart disease in men with diabetes may explain a large component of the excess risk of coronary heart disease associated with diabetes in women. Whatever the reason, the lessons from a study of this sort are clear. Populations are discrete entities, even large ones. The dangers inherent in drawing conclusions based on single populations are only starting to become evident as medicine, almost unwittingly, starts to gain a greater understanding of population genetics. One of the clearest examples recently is the way in which serious side-effects of the coxibs only became apparent once they were in general circulation, covering a far larger and more diverse population than the clinical trial populations that had been used to test safety. It will be interesting to see how much more of the various conventional wisdoms are overturned as more meta-analyses hit the journals.

Huxley R, Barzi F, Woodward M. *BMJ*, doi: [10.1136/bmj.38678.389583.7C](https://doi.org/10.1136/bmj.38678.389583.7C) (published online 21 December 2005).

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