Contrasting epidemiology of aortic aneurysm and peripheral vascular disease in England and Wales

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Age standardised death rates from aortic aneurysm in England and Wales rose 20-fold in men and 11-fold in women between 1950 and 1984.¹ Similar trends have been reported in other Western countries, most of the increase being in deaths from abdominal aneurysms. The scale of the increase suggests that it is probably not simply an artefact of improved diagnosis. Moreover, a review of all necropsies at Malmö General Hospital during 1958-86 showed a clear rise in the prevalence of aortic aneurysmal disease when it was assessed by standard examination techniques.²

The increase in aortic aneurysm is remarkable because it has occurred when rates of other forms of vascular disease, particularly coronary heart disease and stroke, have been falling.³ We therefore examined the distribution of mortality from aortic aneurysm further and compared it with that from peripheral vascular disease, which commonly affects vessels adjacent to the aorta and might be expected to have similar causes.

Method and results

The Office of Population Censuses and Surveys provided us with data on the deaths of people aged 20-74 in England and Wales. We obtained information about the sex, age, underlying cause of death, and county of residence for each person who died during 1974-85. From this we calculated standardised mortality ratios by county for aortic aneurysm (categories 093.0 and 441 in the eighth revision and 441 in the ninth revision of the *International Classification of Diseases*) and peripheral vascular disease (categories 440, 443, 444, and 445 in ICD-8 and 440, 443, 444, and

557 in ICD-9), with stratification for age in five year bands. Population estimates were derived from the 1981 national census.

For people who died during 1979-80 and 1982-90 we obtained the sex, age, underlying cause of death, and most recent full time occupation. Occupations (other than in the armed forces) were recorded for 1 645 363 men and 347 838 women and were used to classify subjects by social class. Proportional mortality ratios for aortic aneurysm and peripheral vascular disease by social class were calculated with age stratified in five year bands.

Death rates from aortic aneurysm were highest in the south and east of England and Wales, whereas peripheral vascular disease was most common in the north and west. This was reflected in a negative correlation (correlation coefficient -0.40; $P < 0.005$) between standardised mortality ratios for the two diseases by county (fig 1). Similarly, there was an inverse relation by social class, proportional mortality ratios for aortic aneurysm being highest in professional occupations while those for peripheral vascular disease were highest in unskilled manual workers.

Comment

This analysis further emphasises the distinctive epidemiology of aortic aneurysm compared with other vascular disease. As for coronary heart disease and stroke, mortality from peripheral vascular disease was highest in the north and west and inversely related to social class. The contrasting distribution of aortic aneurysm cannot be explained by variation in quality of care and resultant death of affected people as such variation would be expected to affect the two diseases in parallel. Screening may have led to higher detection of aneurysmal disease in some areas and social groups, but such large differences in mortality are unlikely to result simply from variable underdiagnosis. In Britain most people whose death is sudden and unexplained undergo necropsy.

Few epidemiological studies have looked at the causes of aortic aneurysm, but two studies have suggested causes similar to those of other atherosclerotic vascular disease—namely, smoking,^{4,5} hypertension,^{4,5} hyperlipidaemia,⁴ and diabetes mellitus.⁵ This is consistent with the observation that people with angina⁴ and peripheral vascular disease⁵ are at higher risk of aortic aneurysms. Our analysis, however, suggests that there are other causes for aortic aneurysm in addition to the well established risk factors for atherosclerosis.

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Conflict of interest: None.

Fig 1—Mortality from aortic aneurysm and peripheral vascular disease in England and Wales in men and women aged 20-74

1 Fowkes FGR, Macintyre CCA, Ruckley CV. Increasing incidence of aortic aneurysms in England and Wales. *BMJ* 1989;298:33-5.

2 Begntsson H, Bergqvist D, Sternby N-H. Increasing prevalence of abdominal aortic aneurysms. *Eur J Surg* 1992;158:19-23.

3 Marmot MG. Coronary heart disease: rise and fall of a modern epidemic. In: Marmot M, Elliott P, eds. *Coronary heart disease epidemiology*. Oxford: Oxford University Press, 1992. 3-19.

4 Reed D, Reed C, Stemmermann G, Hayashi T. Are aortic aneurysms caused by atherosclerosis? *Circulation* 1992;85:205-11.

5 Van Laarhoven CJHM, Borstlap ACW, Van Berge Henegouwen DP, Palmen FMLHG, Verpalen MCPJ, Schoemaker MC. Chronic obstructive pulmonary disease and abdominal aortic aneurysms. *European Journal of Vascular Surgery* 1993;7:386-90.

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