Ethnic differences in mortality from cardiovascular disease in the UK: do they persist in people with diabetes?

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Abstract

Study objective – To determine whether ethnic differences in cardiovascular disease mortality persist in people with non-insulin-dependent diabetes mellitus.

Design – This was an ecological study in which routine mortality data from 1985–86, which coded all mentioned causes of death, provided the numerator. The UK population derived from 1981 census formed the denominator.

Setting – United Kingdom.

Participants – Records of all deaths in people aged 45 years and above were extracted if diabetes was mentioned anywhere on the death certificate. The denominator was aged five years to approximate to the 1986 population. Mortality rates where a cardiovascular underlying cause was given were compared between South Asians, African-Caribbean, and those born in England and Wales. The latter group formed the standard for directly standardised rate ratios.

Main results – Mortality from heart disease was approximately three times higher in diabetic South Asian born men and women than in those with diabetes born in England and Wales. This ethnic difference was greatest in the younger age group. Conversely, stroke mortality rates in African-Caribbeans were 3.5-4 times higher than those in the England and Wales population. Despite this high mortality from stroke, ischaemic heart disease death rates were not high in African-Caribbean men.

Conclusions – Ethnic differences in cardiovascular mortality persisted and were greater in those with diabetes. Thus the high risk of heart disease should be targeted for intervention in South Asians, and the high rates of stroke targeted in African-Caribbeans.

The observation that women with NIDDM lose their relative protection from CVD has provided valuable insights into the relationship between CVD and NIDDM, and helps support the hypothesis that insulin resistance and its effects on lipid homeostasis may be the key to understanding the high rates of CVD in diabetes.

There are also clear ethnic differences in mortality from CVD in the general population, and differences in insulin resistance. People from minority ethnic groups in the UK (predominantly South Asian and African-Caribbean) have diabetes rates that are three to four times that of the general population, but the mortality experience from CVD in these two ethnic groups is very different. South Asian men and women have twice the mortality from CVD than the general population, and much of this is due to the high rates of heart disease.

However, mortality from ischaemic heart disease in African-Caribbeans is only half that of the general population, despite a twofold increase in mortality from stroke.

Examination of CVD mortality in people with NIDDM in relation to ethnicity may further help in understanding the relationship between CVD and diabetes. This would also provide valuable practical indicators of which subgroups should be targeted with specifically designed interventions.

Methods

Routine mortality data provide statistics for underlying cause of death only, they are not particularly helpful for diabetics, where the underlying cause of death is rarely diabetes itself. We used mortality data from 1985–86 for England and Wales, when all conditions mentioned on the death certificate were routinely recorded. All certificates where diabetes (ICD9 code 250) was mentioned for people aged 45 and above were extracted. This age cut-off was used to ensure that only people with NIDDM would be included in the sample.

Ethnicity is not routinely recorded on death certificates. However, place of birth is available, and was used as a proxy for ethnicity. “South Asian” included those born in India, Pakistan, Bangladesh, and Sri Lanka and “African-Caribbean” included all those born in the Caribbean islands. Age specific mortality rates in relation to ethnicity were calculated for the underlying cause of death when diabetes was mentioned anywhere on the death certificate. Underlying causes of death analysed were: all causes, cardiovascular disease (ICD9...
Asians and African-Caribbeans than in people born in England and Wales (table 1). The largest ethnic differences were noted for heart disease deaths in South Asians and stroke deaths in African-Caribbeans.

In South Asians with diabetes, ischaemic heart disease death rates were approximately three times that of people born in England and Wales with diabetes. In contrast, African-Caribbean born men and women had stroke mortality rates which were 3.5–4 times that of the England and Wales population with diabetes, but mortality from heart disease, at least in African-Caribbean born men, was not significantly different to that of the general population with diabetes.

Relative age specific mortality rates show that these ethnic differences persist in younger and older age groups (table 2). However, in South Asians, ischaemic heart disease mortality is four times higher than for people born in England and Wales in the younger age group (45–64 years), and only three times higher in the older age group (65 years and above). This interaction between age group and ethnicity was statistically significant when formally tested: in men, the likelihood ratio statistic (LRS) on one degree of freedom was 6.00 (p=0.01); in women, the LRS on one degree of freedom was 4.64 (p=0.03). This interaction effect persisted for all cardiovascular disease in men (LRS 16.7, p<0.001) and women (LRS 11.5, p<0.001), and for stroke in men (LRS 8.03, p=0.005). There were no significant interactions when African-Caribbeans were compared with people born in England and Wales.

Repeat analysis, using the unaged 1981 census denominator data, showed much larger relative ethnic differences in mortality, but the trends were the same.

**Discussion**

Ethnic differences in CVD mortality persist, and may be enhanced, in the presence of diabetes. We find that diabetes disproportionately increases the risk of ischaemic heart disease mortality in South Asians. In the general population, South Asian mortality rates from heart disease are only 1.5 times those of the general European population,11 but they seem to be three times higher when people with NIDDM are compared. Similarly, while mortality from stroke is twice that of the general population in African-Caribbeans, this risk is increased three to four fold in people with diabetes. Ischaemic heart disease deaths in African-Caribbean born men with diabetes were not significantly higher than those of the general population. Although not statistically significant, there are indications from these data that in South Asians, men had a worse mortality experience than women, whilst in African-Caribbeans this sex ratio was reversed. Again, this reflects the experience of the general population.11

The ideal study design to examine this question would have been to perform a cohort study of people from different ethnic groups with NIDDM, but such a study would be time consuming and expensive. The United King-
Ethy vitality and cardiovascular disease in NIDDM

These findings add new insights to the investigation of the relationship between CVD and diabetes. They also have implications for care providers. Need for preventative care will increase as first generation migrants get older and second generation migrants enter the high risk age group. Young South Asians, especially men, with diabetes are at particular risk of heart disease, and should be targeted for control of obesity, particularly central obesity.10 In African-Caribbeans, the main problem is stroke, associated with high blood pressure.11 This emphasises the need for effective management of hypertension in African-Caribbeans. Despite high blood pressures, African-Caribbeans with diabetes are relatively protected from heart disease. The reasons for this relative protection remain to be established.

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