

## Cardiovascular disease and risk in the Aboriginal population

Anand S, Yusuf S, Jacobs R, Davis AD, Yi Q, Gerstein H, et al. Risk factors, atherosclerosis, and cardiovascular disease among Aboriginal people in Canada: the Study of Health Assessment and Risk Evaluation in Aboriginal Peoples (SHARE-AP). *Lancet* 2001;358:1147-53.

**Background:** The incidence of cardiovascular disease (CVD) among Canada's Aboriginal people is increasing.<sup>1</sup> The prevalence of either CVD or its risk factors, however, is not well known in this population.

**Question:** What is the prevalence of CVD and CVD risk factors in a Canadian Aboriginal population compared with the prevalence in a Canadian population of European ancestry?

**Design:** In this joint study of members of the Six Nations Reserve in Ontario and investigators at McMaster University, potential Aboriginal participants were randomly selected from a comprehensive list of band members. A letter was mailed, followed by a telephone call to identify people 35 to 75 years of age who had lived on the reserve for at least 5 years and did not have a history of cancer or of chronic liver or renal disease. Those identified were asked to participate. The same criteria were used to select subjects of European ancestry who lived in Hamilton, Toronto or Edmonton.

Subjects were asked about their smoking status, history of diabetes mellitus, hypertension and hyperlipidemia, family history of CVD, income status and highest education level achieved. Self-reports of angina, previous myocardial infarction, coronary artery bypass grafting, angioplasty or stroke were accepted as evidence of CVD. Blood pressure and waist-hip ratios were measured, and the body mass index (BMI) was calculated. Electrocardiography was used to detect silent myocardial infarction. Carotid artery atherosclerosis was as-

sessed using B-mode ultrasonography to measure the maximum intimal-medial thickness (IMT) of the vessel.

**Results:** In total, 301 of 379 eligible Aboriginals and 326 of 405 eligible people of European ancestry agreed to participate. Nonrespondents were similar to respondents in both groups. The Aboriginal participants were older than those of European ancestry (mean age 53.1 v. 51.3 years;  $p = 0.04$ ), and more participants of European ancestry had incomes greater than \$60 000 (60% v. 17%,  $p = 0.0001$ ) and attended university (33% v. 10%;  $p = 0.0001$ ). Significantly more Aboriginals had a history of diabetes, hyperlipidemia, hypertension and a family history of myocardial infarction. Diabetes was newly diagnosed in 12% of the Aboriginal participants, as compared with 6% of those in the other group. The waist-hip ratio was above 0.9 in 90% of the Aboriginal men and 41% of the Aboriginal women, as compared with 74% and 8% respectively in the other group. More than half of the Aboriginal subjects had a BMI above 30, and about 40% of them were smokers, as compared with 15% in the other group. Levels of triglycerides, glucose, fibrinogen and plasminogen activator inhibitor were significantly higher in the Aboriginal group; levels of homocysteine and lipoprotein (a) did not differ between the groups. The prevalence of CVD was significantly higher in the Aboriginal group (17% v. 7%,  $p < 0.00002$ ).

The mean maximum IMT of the carotid artery was higher in the Aboriginal group than in the group of European ancestry (0.82 v. 0.78 mm,  $p = 0.027$ ). Although there was an inverse relation between income and CVD, for any income level the absolute rate of CVD and CVD risk factors was significantly higher among the Aboriginal subjects than among those in the other group. Income, hypertension and the glycosylated hemoglobin level were the 3 potentially modifiable risk factors of CVD in the final multivariable regression model.

**Commentary:** Despite limitations imposed by the use of telephone survey methodology, the high prevalence of CVD and CVD risk factors in this Aboriginal population is cause for concern. About half of the Aboriginal subjects had either impaired glucose tolerance, established diabetes or newly diagnosed diabetes, which alone increases the risk of CVD two- to threefold.<sup>2</sup> Although income was a determinant of CVD in both groups, the burden of poverty may be greater among Aboriginals: at every income level, CVD and CVD risk factors were more common in this group than in the group of European ancestry.

**Implications for practice:** An epidemic of CVD can be anticipated in Canada's Aboriginal population unless the current risk factor profile can be modified. Smoking-cessation and weight-reduction programs should be encouraged. Attempts should be made to replicate in an Aboriginal population the results of recent studies showing that lifestyle modification can delay the development of diabetes in those with impaired glucose tolerance.<sup>3</sup> To facilitate the success of CVD risk-reduction programs, the Aboriginal population must be included in their development and implementation.

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