

CAD in South Asians: At a Higher Risk?

Erratum:

The original version of this article, published in the May 2006 issue of *The Canadian Journal of Diagnosis*, contained several errors, namely, in the order of authorship and the biographical information for Dr. Bainey and Dr. Gupta. As a gesture of good faith towards the article's authors and in our continuing effort to provide the most accurate information to our readers, we have chosen to reprint the article in full.

Kevin R. Bainey, BSc, MD; and Milan Gupta, MD

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Cardiovascular disease has become a global pandemic involving both economically-mature and developing nations. In Canada, despite significant declines in cardiovascular mortality rates in recent decades, cardiovascular disease still accounts for the largest proportion of deaths.¹

South Asians, the second largest visible minority group in Canada, appear to be particularly susceptible to developing coronary artery disease (CAD). As well, proportional rates of death from CAD are higher in Canadians of South Asian origin when compared to Canadians of European descent.



South Asian-Canadians: A growing population

South Asians originate from the Indian subcontinent, an area that includes India, Pakistan, Sri Lanka, Nepal and Bangladesh. Currently, South Asians represent approximately one-fifth of the global population.

Canada's favourable immigration policies have resulted in a large influx of South Asians migrating to this country over the past few decades. In 2001, there were over 920,000 South Asians residing in Canada, representing the second largest visible minority and comprising 3.1% of the Canadian population.² At present, South Asian-Canadians are the fastest growing visible minority, with the number of South Asians in this country expected to double by the year 2020.



Migration and cardiovascular risk

The migration of South Asians to urban areas may be an important contributor to their increased cardiovascular risk. Patel³ compared randomly sampled Gujaratis in Britain with non-migrant Gujaratis in India who were matched for age, gender and caste.³ British Gujaratis had a mean BMI that was 6 kg/m² higher than their counterparts in India. As well,

British Gujaratis had:

- higher BP,
- higher total cholesterol,
- higher triglycerides,
- a higher waist-to-hip ratio and
- a higher prevalence of diabetes.

Emerging risk factors, such as apolipoprotein B, fasting plasma insulin levels and C-reactive protein were also higher in the British Gujarati population.

Unique risk factor profile in South Asians

An analysis of the California Mortality Database revealed that South Asian men and women had the highest proportional mortality ratios for CAD, compared to six other ethnic groups.⁴ Similar trends have been seen in Canada, where South Asians experience the highest rates of CAD mortality compared with Canadians of Chinese or European descent (Figure 1).⁵ In addition, South Asians are markedly younger when they first develop heart failure and present with higher risk features.⁶ South Asians, compared to Caucasians, have a similar, if not a lower, prevalence of hypertension, increased LDL-cholesterol (LDL-C) and smoking. Furthermore, South Asians in Canada with a history of MI have fewer conventional risk

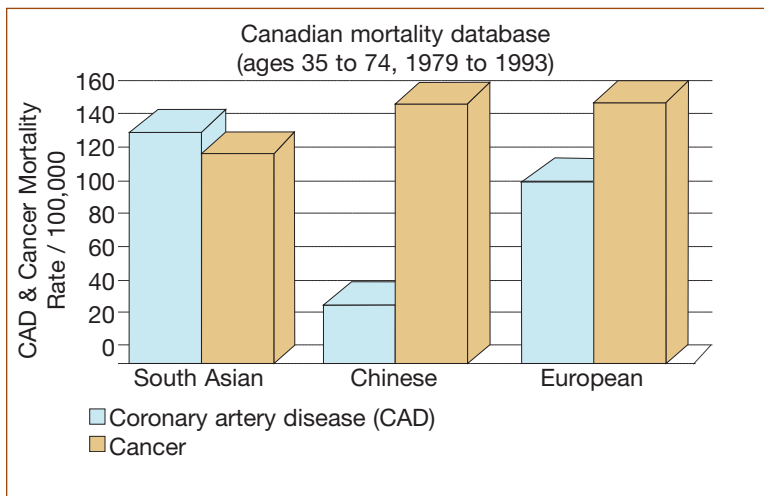


Figure 1: Ethnic-specific mortality patterns from coronary artery disease and cancer in Canada.

factors and a significantly lower BMI compared with matched controls.⁷ However, the prevalence of diabetes is uniformly higher in South Asians. In Canada, the Study of Health Assessment and Risk in Ethnic Groups (SHARE), which compared populations of South Asian, Chinese and European descent, revealed that one-third of middle-aged South Asians either have impaired glucose tolerance or diabetes.⁸ It is more common for South Asians to present with typical diabetic dyslipidemia (*i.e.*, reduced HDL-C and increased triglycerides). Thus, South Asians tend to have fewer conventional CAD risk factors, but their higher prevalence of diabetes does not entirely explain their excess cardiovascular risk.

The metabolic syndrome

South Asians, compared to European Canadians, are at an increased risk of metabolic syndrome.⁸ Patients with risk factors consistent with metabolic syndrome face a greater risk of all-cause mortality and their risk of cardiovascular mortality increases two- to three-fold.⁹ South Asians seem to develop insulin resistance and diabetes at a lower BMI and with lesser degrees of abdominal obesity than do other



Dr. Bainey is a Senior Cardiology Resident, Division of Cardiology, Department of Medicine, University of Alberta Hospital, Edmonton, Alberta.




Dr. Gupta is an Assistant Clinical Professor, Department of Medicine, McMaster University, Hamilton, Ontario; and Staff Cardiologist, William Osler Health Centre, Brampton, Ontario.

Take-home message

- 1) South Asian Canadians are at heightened risk of developing premature CAD, despite having fewer conventional risk factors.
- 2) It is possible that the elevated risk of CAD noted in South Asians may be explained by the increased prevalence of metabolic syndrome and Type 2 diabetes.
- 3) South Asians with multiple risk factors or with features of metabolic syndrome should be considered at significant risk for cardiovascular disease and should be investigated accordingly.
- 4) Importantly, strategies to reduce abdominal obesity and to improve insulin sensitivity should be re-enforced in South Asians in order to optimize cardiovascular health.

ethnic groups.¹⁰ Thus, relying on BMI alone may underestimate the true risk of metabolic syndrome in South Asians. As a result, the World Health Organization has recently recognized the need for ethnicity-specific definitions of obesity and has revised the obesity cut-off in South Asians from BMI > 30kg/m² to BMI > 25kg/m².

Most recently, the INTERHEART study has suggested that the waist-to-hip ratio may be a better predictor of risk than BMI.¹¹ Thus, the increased prevalence of the metabolic syndrome may be a key contributor to the excess CAD noted in South Asians.

The health benefits of reduced abdominal obesity and regular exercise in subjects with metabolic syndrome are well-documented. Given that South Asians are at a particularly high risk for abdominal obesity and insulin resistance, this group is ideally suited for the benefits of therapeutic lifestyle interventions to reduce cardiovascular risk. 

References

1. Heart and Stroke Foundation of Canada: The changing face of heart disease and stroke in Canada in 2000. Statistics Canada, Ottawa, 1999, pp. 23-44.
2. 2001 Census: Population by ethnic origin. Statistics Canada.
3. Patel J, Vyas A, Cruickshank J, et al: Impact of migration on coronary heart disease risk factors: Comparison of Gujaratis in Britain and their contemporaries in villages of origin in India. *Atherosclerosis* 2005; [Epub ahead of print].
4. Palaniappan L, Wang Y and Fortmann S: Coronary heart disease mortality for the six ethnic groups in California, 1990-2000. *Ann Epidemiol* 2004; 14(7):499-506.
5. Sheth T, Nair C, Nargundkar M, et al: Cardiovascular and cancer mortality among Canadians of European, South Asian and Chinese origin from 1979 to 1993: An analysis of 1.2 million deaths. *CMAJ* 1999; 161(5):132-8.
6. Singh N, Gupta M: Clinical characteristics of South Asian patients hospitalized with heart failure. *Ethn Dis* 2005; 15(4):615-19.
7. Gupta M, Doobay A, Singh N, et al: Risk factors, hospital management and outcomes after acute myocardial infarction in South Asian Canadians and matched control subjects. *CMAJ* 2002; 166(6):717-22.
8. Anand S, Yusuf S, Vuksan V, et al: Difference in risk factors, atherosclerosis, and cardiovascular disease between ethnic groups in Canada: The Study of Health Assessment and Risk in Ethnic groups (SHARE). *Lancet* 2000; 356(9226):279-84.
9. Lakka H, Laaksonen D, Lakka TA, et al: The metabolic syndrome and total and cardiovascular disease mortality in middle-aged men. *JAMA* 2002; 288(21):2709-16.
10. Raji A, Seely E, Arky R, et al: Body fat distribution and insulin resistance in healthy Asian Indians and Caucasians. *J Clin Endocrinol Metab* 2001; 86(11):5366-71.
11. Yusuf S, Hawken S, Ounpuu S, et al: Obesity and the risk of myocardial infarction in 27,000 participants from 52 countries: A case-control study. *Lancet* 2005; 366(9497):1640-9.