

Prevention and Management of Diabetes in South Asians

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ABSTRACT

South Asians, the fastest growing immigrant population and the second-largest visible minority in Canada, are 3 to 5 times more likely to have diabetes than the white population. This review discusses challenges related to the prevention and management of diabetes in the South Asian population in Canada. Several studies have suggested that, despite their generally lower body mass index, South Asians have an increased incidence of abdominal obesity, insulin resistance and metabolic syndrome. In addition, although the incidence of diabetes among South Asians has increased in recent decades, the majority of cases are still undiagnosed and thus poorly controlled. Suboptimal treatment of diabetes in South Asians may be due to several barriers, including a lack of knowledge about diabetes, negative beliefs and attitudes relating to diabetes, and noncompliance with lifestyle changes such as diet, weight control and physical activity, all of which are compounded by a lack of culturally sensitive and ethnic-language-specific diabetes education centres in Canada. Improved efforts toward the primary prevention and optimal management of type 2 diabetes are necessary to reduce the burden of diabetes and its complications among South Asians in Canada.

KEYWORDS

Coronary artery disease, diabetes, ethnicity, impaired glucose tolerance, metabolic syndrome, prediabetes, primary prevention, South Asians

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RÉSUMÉ

Les Asiatiques du Sud, qui représentent la population immigrante dont la croissance est la plus rapide et sont au deuxième rang des minorités visibles au Canada, sont de trois à cinq fois plus exposés au diabète que la population de race blanche. Cet article traite des défis associés à la prévention et à la prise en charge du diabète chez les Asiatiques du Sud du Canada. Plusieurs études ont laissé entendre que même si les Asiatiques du Sud ont généralement un indice de masse corporelle inférieur, l'incidence de l'obésité abdominale, de l'insulinorésistance et du syndrome métabolique est plus élevée chez eux. De plus, même si l'incidence du diabète a augmenté chez les Asiatiques du Sud au cours des dernières décennies, la majorité des cas de diabète n'ont pas encore été diagnostiqués et sont par conséquent mal maîtrisés. Le traitement sous-optimal du diabète chez les Asiatiques du Sud pourrait être attribuable à plusieurs facteurs dont un manque de connaissances sur le diabète, des croyances et des attitudes négatives au sujet du diabète et le non-respect des recommandations liées au mode de vie, soit à l'alimentation, au contrôle du poids et à l'activité physique. À tous ces facteurs s'ajoute le manque de centres d'information diabétique adaptés à leur culture et où ils pourraient s'exprimer dans leur langue. Pour réduire le fardeau du diabète et de ses complications chez les Asiatiques du Sud du Canada, il faudra redoubler d'effort pour la prévention primaire et la prise en charge optimale du diabète de type 2.

MOTS CLÉS

Asiatiques du Sud, diabète, origine ethnique, coronaropathie, prévention primaire, intolérance au glucose, pré-diabète, syndrome métabolique

INTRODUCTION

South Asians are those whose ethnic origin is the Indian subcontinent, which comprises India, Pakistan, Sri Lanka, Nepal and Bangladesh. The combined population of these 5 countries is about 1.5 billion, representing more than 20% of the global population (1). The fastest-growing immigrant population and the second-largest visible minority in Canada (1), South Asians represent 3.1% of the Canadian population (917 070 people) according to the 2001 census, and will be the most prominent visible minority group in Canada by 2017, at an estimated 1.7 million (1).

The prevalence of diabetes is much higher among South Asians than it is in the general population (2-6); indeed, South Asians are 3 to 5 times more likely to develop type 2 diabetes (3-9), and the prevalence of diabetes among South Asians living in the United Kingdom, the United States and Canada has been found to be as high as 12 to 15%, compared with 3 to 5% in white people (6-9). In addition, South Asian children and adolescents have an increased risk of diabetes: it develops about 10 years earlier in South Asians than in Europeans (6). This review discusses the challenges of preventing and managing diabetes in South Asians in Canada.

ETHNIC DISPARITY: REASONS

What are the reasons for South Asians' increased risk of developing diabetes? Several studies have suggested that it is due in part to genetic susceptibility, as well as increased incidence of abdominal obesity, insulin resistance and metabolic syndrome among South Asians compared with other populations (3-9), and indeed, South Asians have been shown to have an increased prevalence of prediabetes as well as diabetes (4-11).

Genetic susceptibility

According to the thrifty-gene hypothesis, genetically susceptible South Asians exposed to a Western lifestyle involving a high-calorie diet and minimal physical activity will be more likely to develop insulin resistance and diabetes (10-15). Some researchers have proposed that the thrifty-phenotype hypothesis accounts for the seemingly fetal origin of the disease (15,16) in this population. Low birth weight has been shown to be related to the development of type 2 diabetes later in life (16), and since almost one-third of all newborns in India have a low birth weight (15,16), this observation may, at least in part, explain the epidemic of diabetes in India. Others have also suggested a development origin of health and disease (7-11,17). The Pune Maternal Nutrition Study, 1 of the first studies to follow maternal health through prepregnancy, serial fetal growth and postnatal growth, suggested that the thin-fat phenotype (muscle thin, body fat), which is more common in South Asian babies, is associated with an increased risk of developing diabetes (9,17). Finally, a recent study showed that South Asian babies have increased levels of cord leptin and insulin, suggesting an intrauterine origin for adiposity and hyperinsulinemia (17).

Fat distribution

Fat distribution, which varies widely in different populations, confers differential health risks, and South Asians are likely to have more visceral fat at any body mass index (BMI) than white people. Having more visceral fat is associated with a higher degree of insulin resistance, and indeed, South Asians also tend to manifest excessive insulin resistance, even in the absence of obesity (7-12). As well, a number of adipokines are secreted by visceral fat. High levels of leptin, high-sensitivity C-reactive protein and nonesterified fatty acids, as well as low levels of adiponectin, are associated with insulin resistance, and several small studies have found such levels in South Asian patients (10,11,18).

Because South Asians have been found to have an increased incidence of both diabetes and coronary artery disease at lower BMIs than white people (7-11), the World Health Organization now recommends different BMI cutoff points for these patients (overweight, BMI >23 kg/m²; obese, BMI >25 kg/m²) (19).

Metabolic syndrome

Several definitions of metabolic syndrome have been proposed since Reaven noted its existence in 1988 (20), but central obesity (abdominal obesity), insulin resistance, dysglycemia and hypertension are the essential components, regardless of the specific definition used. According to the International Diabetes Federation (IDF) (21), central obesity is an essential component of metabolic syndrome because of its strong correlation with other features of the syndrome. Because several studies (10,11,20,21) have suggested that metabolic abnormalities are present in certain ethnic groups (such as South Asians) at much lower waist circumferences, the IDF (21), like the WHO, has recommended ethnic-specific waist circumference cutoff points for South Asians (90 cm for men; 80 cm for women) that are lower than those for Europeans.

PRIMARY PREVENTION OF DIABETES

Despite the increased prevalence of diabetes among South Asians, a majority of cases go undiagnosed and, as a result, poorly controlled (4,8). Several studies (7-9) have shown that many South Asians have diabetes-related complications at the time of diagnosis, indicating a prolonged latent phase of undiagnosed diabetes.

Lifestyle intervention

In the past 5 years, many large clinical trials focusing on the role of lifestyle intervention in primary prevention have been published (22-26). Two large, randomized clinical trials – the Finnish Diabetes Prevention Study (22) and the American Diabetes Prevention Program (23) – have found that intensive lifestyle modifications are associated with a 58% reduction in the incidence of diabetes in people at high risk of developing the disease. Similarly, the results of several trials of pharmacological interventions to prevent

progression from impaired glucose tolerance (IGT) to diabetes (23-26) have shown that metformin, acarbose and rosiglitazone are all related to a marked reduction in the risk of progression (24-26).

Recently, Ramachandran and colleagues (27) in the Indian Diabetes Prevention Program tested the hypothesis that the progression of diabetes could be influenced by lifestyle interventions in Indian subjects with IGT who were younger, leaner and yet more insulin-resistant than the predominantly white populations of other lifestyle-intervention studies (22,23). They found that progression from IGT to diabetes was very high: 55% over 3 years (18.3% per year) in this nonobese yet highly insulin-resistant population (27). With interventions, the relative risk reduction was 28.5% in the lifestyle-modification group, 26.4% in the metformin group and 28.2% in the metformin plus lifestyle-modification group compared with controls.

All of these studies have shown that the progression from IGT to diabetes can be prevented or delayed with lifestyle-intervention programs (22-27). Based on these studies, the number of patients with IGT who would require treatment for a year to prevent 1 case of diabetes would be just 20 to 30 (22-27), confirming the paramount importance of primary prevention efforts in order to reduce the burden of type 2 diabetes and its complications.

Screening

Efficient use of screening is needed in the South Asian population because of their higher incidence of IGT (13) and more rapid progression from IGT to diabetes (28), and a number of strategies may be used to determine risk in a multiethnic Canadian population (28,29). According to the Canadian Diabetes Association clinical practice guidelines (2), measurement of fasting plasma glucose (FPG) is the recommended screening test for diabetes; this should be followed by a 2-h 75-g oral glucose tolerance test when FPG is 5.7 to 6.9 mmol/L and accompanied by 1 or more risk factors for diabetes/IGT (including ethnicity). South Asians with prediabetic states (impaired fasting glucose [IFG], IGT and metabolic syndrome) can be further classified using the new ethnic-specific cut-off points for BMI and waist circumference to help identify people who would benefit most from lifestyle or pharmacological interventions aimed at primary prevention of diabetes (8,14,18,30).

Although ethnically and culturally sensitive research into diabetes screening is currently limited, ethnicity-based initiatives are beginning to emerge nationally and internationally. For example, Davachi and colleagues have developed a culturally sensitive community-based diabetes screening and awareness program in Calgary, Alberta, Canada (5). This study showed a high incidence of obesity (67%) and abdominal obesity (73%) in 920 Indo-Asian subjects based on the ethnic-specific cutoff points for BMI and waist circumference. A considerable number of subjects also had high

random blood glucose levels (36%) and a family history of diabetes (43%). Although the study had several limitations, its results emphasize the alarming number of South Asians who may have obesity and diabetes, and highlight the ongoing need for community-based, culturally sensitive diabetic screening programs for this high-risk population.

Jafar and colleagues (30) studied the prevalence of overweight or obesity among 8972 people in Pakistan who were 15 years or older, and their results revealed that 25% of the population would be classified as overweight or obese with the use of the ethnic-specific BMI cutoffs. They also found an independent association between a BMI ≥ 23 kg/m² and the presence of diabetes, hypertension or high serum cholesterol values. In fact, their findings supported the use of even lower BMI cutoff values than those already proposed for the South Asian population.

MANAGEMENT OF DIABETES

Treatment of diabetes in South Asians should follow the current Canadian clinical practice guidelines (2), and like the general population, South Asians with diabetes should strive to maintain excellent control of their diabetes and associated risk factors. Many diabetes-related complications, particularly premature death due to heart disease, can be prevented or at least delayed by optimal management of diabetes and its associated risk factors (4-9). Studies have shown that many South Asians develop diabetes-related complications, particularly cardiac and renal complications, much earlier than other populations (3-9). Because of the high rates of mortality from cardiovascular disease in this population (10,11), early and aggressive vascular protection and simultaneous management of cardiovascular risk factors by controlling hypertension and dyslipidemia, in addition to dysglycemia, are recommended (10-14).

The United Kingdom Asian Diabetes Study (31) tested the hypothesis that enhanced care for diabetes by Asian link workers and extra sessions with a community diabetes specialist nurse that were tailored to the needs of South Asians would improve risk factors for diabetes-related complications, and, therefore morbidity and mortality. The data indicated that it was possible to reduce blood pressure and cholesterol in South Asians with diabetes.

As well, oral antihyperglycemic agents that reduce insulin resistance (32) seem to be highly beneficial for the management of diabetes in South Asians.

Because diabetes has been shown to be a coronary equivalent, patients with diabetes should be treated as patients at high risk for cardiovascular disease (33). For example, recently, the results of the first large, randomized, lipid-lowering trial done exclusively on the South Asian population in North America showed that both rosuvastatin and atorvastatin were well tolerated and effective in helping most high-risk South Asian patients reach the recommended low-density lipoprotein cholesterol targets (34).

BARRIERS TO DIABETES MANAGEMENT

The list of barriers to the management of diabetes in South Asians summarized here is based on published reports, as well as the personal experiences of the author and health professionals involved in the care of South Asians (4,7-9). Most South Asians with diabetes have a poor understanding of the disease and are unaware of its related complications (7,8,32,35-41). Suboptimal treatment in this population may be due to denial, language barriers, low literacy rates and a lack of knowledge about diabetes (4,7). Many South Asians have negative beliefs and attitudes about diabetes; they often believe that fate and God will “look after” their diabetes (35,38). They also tend to have poor rates of compliance with lifestyle changes such as diet, weight control and physical activity (35-37). A typical South Asian diet is quite rich in fat and carbohydrates: South Asians tend to eat foods cooked in large amounts of oil or ghee (clarified butter) and large quantities of sweets loaded with fat and sugar—all of which are part of almost every cultural or religious celebration (4,35).

In the author’s opinion, compliance with medications is also a significant problem in the South Asian population (4,35). Many South Asian patients are reluctant to take medications because of side effects and potential cost. They are also reluctant to buy diabetes equipment and supplies because of cost and a lack of knowledge about the need for self-management of the disease. South Asians tend to believe in alternative therapies (herbal and naturopathic medications), and some prefer these to allopathic medications. As well, many patients regularly visit their country of origin to buy medications at lower costs and continue taking these medications without regular follow-up by a Canadian doctor. Often, certain combinations of medications are available in their country of origin, but not in Canada, making a switch to available medications in Canada a challenge.

At the provider level, barriers include a lack of culturally and language-specific diabetes education centres in Canada (5). Accessibility may also be an issue; the waiting period to attend existing diabetes education centres may be long. Restrictions on provincial formulary plans also limit access to diabetes medications for those who need them most. Primary prevention requires the collaboration of healthcare professionals, community leaders, media and local, provincial and federal funding agencies.

FUTURE DIRECTIONS

Although ethnicity-based research in Canada is a growing trend, ethnically and culturally specific diabetes initiatives are still limited. South Asian patients would benefit from more frequent screening for prediabetes and diabetes at a younger age than white patients. Efficient use of screening is needed to identify South Asians with IGT because of its increased prevalence and the rapid progression from IGT to diabetes in this population. Community-based diabetes screening programs should also be established to target

South Asians who are at high risk of developing type 2 diabetes. The new ethnic-specific cut-off points for BMI and waist circumference should be used to stratify risk in this population, and among South Asians with prediabetes (IFG, IGT or metabolic syndrome), a structured, culturally and linguistically relevant program of lifestyle modifications that includes a healthy diet, weight control and regular exercise should be implemented to reduce the risk and burden of type 2 diabetes.

Healthcare professionals also need to increase their awareness of diabetes-related issues in this population and educate South Asian patients about the seriousness of diabetes complications. Given their high rates of mortality due to cardiovascular disease, South Asian patients should also be aggressively managed for cardiovascular risk factors. Finally, healthcare professionals need to develop culture- and language-specific community-based multidisciplinary approaches to the optimal management of diabetes in South Asians.

AUTHOR DISCLOSURES

No duality of interest declared.

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