



CME/View Point/Book Review

Preventing Cardiovascular Disease in Indian Immigrants to the United States

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ABSTRACT

People of South Asian origin (those originating in India, Pakistan, Bangladesh, Bhutan, Nepal, and Sri Lanka) are an increasing proportion of the population of the United States (US) and have been found to have increased risk of cardiovascular disease (CVD). The known risk factors for CVD in this population include biological risk factors such as increased prevalence of metabolic diseases and non-biological risk factors such as poor diet and exercise habits. The health of immigrants from South Asia to western countries has been found to be worse than their counterparts in their native country. In addition, acculturation and social connections may play a role in decreasing risk. Solutions to prevent CVD include earlier risk assessment and initiation of cardioprotective medications, providing culturally appropriate health recommendations, and performing further research on South Asian populations in the US with disaggregation of populations of different origins.

Keywords: Cardiovascular disease, Prevention, Lifestyle

INTRODUCTION WITH OBJECTIVES

People of South Asian origin (those originating in India, Pakistan, Bangladesh, Bhutan, Nepal, and Sri Lanka) make up an increasing proportion of the population of the United States (US) since immigration from South Asia to North America began in the mid-20th century. While cardiovascular disease (CVD) is a major public health burden among all populations in the US, people of South Asian origin are well-known to have heightened risk compared to other populations. Recent emphasis has been placed on understanding risk factors and prevention of cardiac disease among South Asians in the US, in particular, the Mediators of Atherosclerosis in South Asians Living in America (MASALA) study has provided significant data about the various factors affecting CVD in this population. In this opinion piece, we aim to discuss the current research elucidating the biological and sociocultural reasons why people of South Asian origin are at increased risk of CVD, with particular focus on differences between South Asians living in their native countries and abroad. Finally, we will discuss proposed solutions to prevent CVD in Indians living in the US.

BIOLOGICAL RISK FACTORS

Indians, both in India and those of Indian origin abroad, are at higher risk of metabolic diseases that cause a heightened risk of CVD including diabetes and metabolic syndrome. South Asians

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have a two-fold higher risk of type 2 diabetes mellitus with evidence suggesting higher rates of insulin resistance even at normal weight; this difference was hypothesized to be due to decreased beta-cell function in people of South Asian descent.¹ Further studies have found that compared to other ethnic groups in the US, South Asians have greater visceral fat and less lean mass despite having lower body mass index (BMI), waist circumference, and body weight.²

Interestingly, research has also found that South Asians living in other countries are more likely to be obese than South Asians living in their native country.³ As obesity and increased visceral fat are well-known risk factors for CVD, these differences in body habitus may explain part of the increased risk. Dyslipidemia is also highly prevalent among South Asians, with South Asians living in the US having increased triglycerides, higher total cholesterol, higher low-density lipoprotein cholesterol, and lower high-density lipoprotein cholesterol than their counterparts in Asia.⁴ Several studies have been performed attempting to identify genetic causes of these biological differences, with thus far inconclusive results.⁵ Altogether, these biological risk factors for CVD are increased in South Asians compared to other ethnicities in the US and in South Asian immigrants to the US compared to their counterparts remaining in Asia.

SOCIOCULTURAL FACTORS

In addition to some biological risk factors, sociocultural factors such as diet, exercise habits, and other health behaviors cause an increased risk of CVD among Indian-Americans. Although the current American Heart Association diet guidelines emphasize a diet high in fruit and vegetables,⁶ South Asians who ate a traditional vegetarian diet had similar metabolic profiles to their counterparts who ate Western diets.⁷ This may be due to the prevalence of carbohydrates such as rice, rotis, and potatoes in the traditional Indian diet and the relative paucity of lean meats and proteins, even in those Indians who eat non-vegetarian food. South Asians had worse exercise habits, with decreased physical activity levels compared to people of other ethnicities in the US.⁵ Tobacco use is one of the strongest modifiable risk factors for CVD; fewer South Asians in the US use tobacco products compared to South Asians living in their native countries.⁵

Recent studies have assessed the effects of acculturation on CVD. Overall, South Asians who resided in the US for greater amounts of time had worse markers of CVD. As South Asians remain in the US for longer periods of time, they tend to Westernize their diets, adding more processed foods and added sugars.⁷ Results from the MASALA study have found that immigrants with moderate connection to traditional cultural beliefs had the best cardiovascular health compared to those who scored low or high on the same scale,⁸ possibly attributable to these participants considering

themselves to have a bicultural identity: Identifying with both American and South Asian culture. It was additionally found that those who had larger social networks had better cardiovascular health.⁹

RISK-ASSESSMENT

There are several risk assessment algorithms commonly used by clinicians in the US, most notably the American Heart Association/American College of Cardiology atherosclerotic CVD risk calculator. However, the original studies these equations were derived from did not assess South Asian participants; it is acknowledged that these may underestimate the risk of cardiac events in patients of South Asian descent.⁵

American organizations and the World Health Organization have also suggested lowering BMI cutoffs that trigger screening for metabolic diseases such as type 2 diabetes in people of Asian descent,¹⁰ allowing for earlier screening and possibly earlier initiation of medication. Overall, American physicians should have a lower threshold for screening their South Asian patients for CVD or its risk factor diseases (hypertension, type 2 diabetes) than for patients of other ethnicities. While patients of Asian descent are generally started on lower doses of statins due to concern for side effects, studies suggest that South Asians can tolerate and benefit from doses more closely aligned with those given to non-Hispanic White populations in the US.¹¹

PREVENTION

For those patients who are identified as higher risk, there are pharmaceutical and non-pharmaceutical interventions that may be implemented. In terms of pharmaceutical interventions, current consensus guidelines in the US have encouraged early initiation of statin and antihypertensive medications in South Asian patients who may be at higher risk, with particular focus on anti-lipid drugs.⁵

However, even with increased data on the prevention of CVD, there remain limitations. The US is a very multicultural country and medical education focuses on delivering culturally appropriate health recommendations; however, there is a need for increased education specifically regarding Indian and other South Asian communities. Most research in the US aggregates all people of Asian descent into one ethnic group, regardless of where they originate from. This masks the heterogeneity of epidemiological differences between people with origin from different countries and removes the ability to provide culturally appropriate care. Recent guidelines from the American National Institutes of Health have suggested dis-aggregating this data and performing more specific research on individual ethnic communities in the US.¹² Furthermore, even the designation of "South Asian" as a study population is problematic, as the population

includes participants from multiple countries, with varying cultural practices, religious beliefs, and economic struggles that may affect their health. Note that while the MASALA study recruits participants with ≥ 3 grandparents born in India, Pakistan, Bangladesh, Nepal, or Sri Lanka, it only included participants fluent in English, Hindi, or Urdu,¹³ excluding those who spoke, for example, only Bengali. However, population levels remain too small at this time for large prospective studies dividing South Asians into their component countries.

The more difficult question is how to address lifestyle modifications among Indian-Americans. Diet has deep cultural connections; eating mishti (Indian sweets) may allow one to be more connected to Indian culture, or pizza and fries help one to fit in and acculturate to North American society. Proposed solutions include further education regarding the effects of highly processed foods and highly caloric diets. For those immigrants who choose to focus on more cultural foods, it may be helpful to educate which foods are lower in carbohydrates. For example, patients can be suggested to eat more lentils, vegetables, and fish compared to more carbohydrate heavy foods such as potatoes. Another suggestion may be to suggest whole grains such as brown rice or quinoa in lieu of white rice or processed wheat rotis. For those who choose to alter their diet to more closely simulate the Western diet, emphasis should be placed on the more healthful aspects of a Western diet: encouraging lean meats and fresh fruits and vegetables compared to processed foods and red meats. Studies in the US have found that encouraging South Asians to eat culturally appropriate healthy foods and participate in exercise that has connections to Indian culture, such as Bollywood dance and yoga, increases adherence to these interventions and subsequently improves health outcomes.⁵

Finally, considering the necessity of culturally appropriate care and the positive effects of social connectedness on CVD, it is imperative for Indian Americans to be connected to India both on individual and institutional levels. On the individual level, Indian immigrants to the US may benefit from having larger social networks consisting of their friends and family from home and also making new connections in the US, allowing them to truly lean into the bicultural identity. To determine which culturally appropriate interventions may be helpful and to gain the sample sizes necessary to study possible genetic causes of CVD, it may also be best for American institutions to collaborate with international partners, including institutions in India, the United Kingdom, and other countries that have high populations of people of South Asian descent.

CONCLUSION

Overall, there is a dire need to address causes and prevention of CVD in people of Indian descent in the US, though

limitations of study methods limit understanding of patients of specific origins. There are biological and sociological risk factors common to both South Asians in the US and their counterparts in their countries of origin, though immigrant South Asians face unique risk factors including worse diets and difficulties with acculturation and identity. Solutions involve medical interventions such as earlier screening and initiation of cardiac medications as well as sociological interventions including increasing social connectedness and providing culturally relevant diet and exercise suggestions.

Ethical approval

The Institutional Review Board approval is not required.

Declaration of patient consent

Patient's consent was not required as there are no patients in this study.

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Conflicts of interest

There are no conflicts of interest.

Use of artificial intelligence (AI)-assisted technology for manuscript preparation

The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

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