Addressing Cardiovascular Disparities in South Asian People

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South Asian people (i.e., from India, Pakistan, Bangladesh, Nepal, Sri Lanka, Maldives, or Bhutan) are the fastest-growing minority group in the United States, with nearly 5.4 million residents.[1,2] Family physicians should be aware that people of South Asian ancestry have a disproportionately higher burden of aggressive and premature atherosclerotic cardiovascular disease (ASCVD) compared with other racial and ethnic groups.[3] South Asian people also have higher hospitalization and mortality rates from ASCVD than other ethnic groups and at younger ages. The American College of Cardiology (ACC) and American Heart Association (AHA) recognize South Asian ancestry as a risk-increasing factor for cardiac disease.[4-6]

Unfortunately, the etiologies behind this disparity are not well understood. South Asian people represent a diverse population from multiple countries with complex intergenerational and sociocultural histories that affect health and access to medical care.[7] More research on the causes and long-term outcomes of ASCVD in South Asian people is needed. Although research is lagging in studying this population in the United States, it is reasonable to use the country of family origin as a crude measure to prevent potentially catastrophic outcomes.

Risk calculators such as the Framingham Risk Score and AHA/ACC pooled cohort equation underestimate cardiovascular risk in South Asian people because these traditional tools were not validated in that population.[8] Although the AHA's newer PREVENT (Predicting Risk of Cardiovascular Disease Events) calculator is more comprehensive because it focuses on younger patients with cardiovascular/kidney/metabolic risk factors, it has the potential for underestimating ASCVD risk in patients of South Asian ethnicity.[9] Importantly, race and ethnicity were defined as social factors, not biologic variables. The PREVENT tool has not been evaluated independently in South Asian people, which misses the potential genetic implications of ancestry.[10] Therefore, the AHA has called for increasingly diverse samples and more studies in populations at high risk in future iterations of the tool.[9]

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The QRISK3 calculator (https://qrisk.org) includes South Asian ethnicity as an additional risk factor to estimate the risk of having a heart attack or stroke in the next 10 years.[1,7] This risk assessment tool was derived and validated in 2.3 million people in England and Wales to more accurately estimate cardiovascular risk in ethnic groups and found higher median risk scores for South Asian people than other tools.[11,12] QRISK3 asks for the standard deviation of blood pressure, which is not needed to complete the assessment. Although similar tools are lacking in the United States, studies are ongoing.[13,14]

Cardiovascular health disparities in South Asian people are thought to be driven by an increased prevalence of traditional risk factors, specifically insulin resistance and metabolic syndrome.[15-17] South Asian people tend to have increased central obesity at a lower body mass index (BMI).[18] The World Health Organization, ACC, and Diabetes.co.uk support ethnicity-specific BMI cutoffs and advocate targeting a lower BMI in South Asian people (less than 23 kg per m^2 instead of the traditionally accepted 25 kg per m^2).[19-23] The International Diabetes Federation has also introduced ethnicity-specific waist circumference cutoffs (less than 90 cm in men instead of 102 cm; less than 80 cm in women instead of 88 cm) for South Asian people to improve early recognition of metabolic syndrome.[24] Higher levels of atherogenic inflammatory lipids (i.e., lipoprotein (a), apolipoprotein B, triglycerides, low-density lipoprotein cholesterol, and low-density lipoprotein particles), increased truncal obesity, and increased insulin levels have also been implicated in the development of early, aggressive ASCVD in South Asian people.[1,3,25]

Early detection of impaired glucose metabolism (fasting blood glucose level greater than 100 mg per dL [5.55 mmol per L]) can help identify patients at high risk instead of relying on A1C alone.[3,24] Some experts recommend treating patients to a goal A1C of less than 6%.[25] In addition to screening for a family history of premature heart disease (younger than 55 years) or a personal history of hyperlipidemia, a lipoprotein(a) blood test can help identify patients at high risk who may not know their family history.[1,25] Obtaining a urine albumin-creatinine ratio when indicated, such as in diabetes mellitus, can detect kidney disease, an established risk factor for ASCVD.[9] To further improve cardiac risk stratification of South Asian people in the United States, the QRISK3 score can be adopted from the United Kingdom and used with current AHA/ACC risk calculators.

Primary prevention of cardiac events through lifestyle changes is essential in South Asian people because of cultural practices related to diet and physical activity. Studies

investigating cardiovascular risk in this population have demonstrated increased high-carbohydrate consumption (e.g., rice, roti, grains, bread) and low-protein diets, making them susceptible to insulin resistance.[1,3,26] Studies in this population have documented lower levels of physical activity and cardiorespiratory fitness and decreased awareness of the importance of regular exercise.[1,3,27,28] Many may not be familiar with their generational family history due to differences in medical care in their countries of origin. Recognizing sociocultural risk factors makes culturally informed counseling on diet and exercise especially important in South Asian people.

Family physicians can prevent early deaths in this population by recognizing disparate health outcomes, considering ethnicity-specific cardiovascular risk assessments and counseling, and referring South Asian patients to cardiology when appropriate to treat ASCVD early and aggressively.

REFERENCES

1. Volgman AS, Palaniappan LS, Aggarwal NT, et al. Atherosclerotic cardiovascular disease in South Asians in the United States: epidemiology, risk factors, and treatments: a scientific statement from the American Heart Association [published correction appears in *Circulation*. 2018;138(5):e76]. *Circulation*. 2018;138(1):e1-e34.
2. South Asian Americans Leading Together. Demographic information. Accessed May 7, 2024. https://saalt.org/south-asians-in-the-us/demographic-information
3. Shah KS, Patel J, Rifai MA, et al. Cardiovascular risk management in the South Asian patient: a review. *Health Sci Rev (Oxf)*. 2022;4:100045.
4. Yusuf S, Hawken S, Ounpuu S, et al. Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART study): case-control study. *Lancet*. 2004;364(9438): 937-952.
5. Zahid N, Meyer HE, Kumar BN, et al. High levels of cardiovascular risk factors among Pakistanis in Norway compared to Pakistanis in Pakistan. *J Obes*. 2011;2011:163749.
6. Anand SS, Yusuf S, Vuksan V, et al. Differences 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):279-284.
7. Gopal DP, Usher-Smith JA. Cardiovascular risk models for South Asian populations: a systematic review. *Int J Public Health*. 2016;61(5): 525-534.
8. American Heart Association. Heart risk 'calculators' overlook increased risk for people of South Asian ancestry. July 12, 2021. Accessed May 7, 2024. https://newsroom.heart.org/news/heart-risk-calculators-overlook-increased-risk-for-people-of-south-asian-ancestry
9. Khan SS, Coresh J, Pencina MJ, et al. Novel prediction equations for absolute risk assessment of total cardiovascular disease incorporating cardiovascular-kidney-metabolic health: a scientific statement from the American Heart Association. *Circulation*. 2023;148(24):1982-2004.
10. Lu C, Ahmed R, Lamri A, et al. Use of race, ethnicity, and ancestry data in health research. *PLOS Glob Public Health*. 2022;2(9):e0001060.
11. Tillin T, Hughes AD, Whincup P, et al. Ethnicity and prediction of cardiovascular disease: performance of QRISK2 and Framingham scores in a U.K. tri-ethnic prospective cohort study (SABRE—Southall And Brent REvisited). *Heart*. 2014;100(1):60-67.
12. Lloyd-Jones DM, Braun LT, Ndumele CE, et al. Use of risk assessment tools to guide decision-making in the primary prevention of atherosclerotic cardiovascular disease: a special report from the American Heart Association and American College of Cardiology [published correction appears in *Circulation*. 2019;139(25):e1188]. *Circulation*. 2019;139(25):e1162-e1177.
13. Congress.gov. H.R. 3771 - South Asian Heart Health Awareness and Research Act of 2022. Accessed May 7, 2024. https://www.congress.gov/bill/117th-congress/house-bill/3771
14. The MASALA Study Coordinating Center. The Mediators of Atherosclerosis in South Asians Living in America (MASALA) Study. Accessed May 7, 2024. https://www.masalastudy.org
15. Flowers E, Molina C, Mathur A, et al. Prevalence of metabolic syndrome in South Asians residing in the United States. *Metab Syndr Relat Disord*. 2010;8(5):417-423.
16. Fernando E, Razak F, Lear SA, et al. Cardiovascular disease in South Asian migrants. *Can J Cardiol*. 2015;31(9):1139-1150.
17. Gujral UP, Pradeepa R, Weber MB, et al. Type 2 diabetes in South Asians: similarities and differences with white Caucasian and other populations. *Ann N Y Acad Sci*. 2013;1281(1):51-63.
18. Jayawardena R, Sooriyaarachchi P, Misra A. Abdominal obesity and metabolic syndrome in South Asians: prevention and management. *Expert Rev Endocrinol Metab*. 2021;16(6):339-349.
19. Caleyachetty R, Barber TM, Mohammed NI, et al. Ethnicity-specific BMI cutoffs for obesity based on type 2 diabetes risk in England: a population-based cohort study [published correction appears in *Lancet Diabetes Endocrinol*; 2021;9(7):e2]. *Lancet Diabetes Endocrinol*. 2021;9(7):419-426.
20. WHO Expert Consultation. Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies [published correction appears in *Lancet*. 2004;363(9412):902]. *Lancet*. 2004;363(9403):157-163.
21. Diabetes.co.uk. BMI values for South Asians. Accessed May 7, 2024. https://www.diabetes.co.uk/south-asian/bmi-values-for-south-asians.html
22. Gulati M, Levy PD, Mukherjee D, et al. 2021 AHA/ACC/ASE/CHEST/SAEM/SCCT/SCMR guideline for the evaluation and diagnosis of chest pain: executive summary: a report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. *J Am Coll Cardiol*. 2021;78(22): 2218-2261.
23. Arnett DK, Blumenthal RS, Albert MA, et al. 2019 ACC/AHA guideline on the primary prevention of cardiovascular disease: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Circulation*. 2019;140(11): e596-e646.
24. International Diabetes Federation. The IDF consensus worldwide definition of the metabolic syndrome. 2006. Accessed May 7, 2024. https://idf.org/media/uploads/2023/05/attachments-30.pdf
25. Kalra D, Vijayaraghavan K, Sikand G, et al. Prevention of atherosclerotic cardiovascular disease in South Asians in the US: a clinical perspective from the National Lipid Association. *J Clin Lipidol*. 2021;15(3):402-422.
26. Misra A, Khurana L, Isharwal S, et al. South Asian diets and insulin resistance. *Br J Nutr*. 2009;101(4):465-473.
27. Ghouri N, Purves D, McConnachie A, et al. Lower cardiorespiratory fitness contributes to increased insulin resistance and fasting glycaemia in middle-aged South Asian compared with European men living in the UK. *Diabetologia*. 2013;56(10):2238-2249.
28. Kandula NR, Tirodkar MA, Lauderdale DS, et al. Knowledge gaps and misconceptions about coronary heart disease among U.S. South Asians. *Am J Prev Med*. 2010;38(4):439-442. ■