LETTER TO THE EDITOR

Comments on M. Iqbal et al (J Pak Med Assoc 2021 January (1-A): 98-100)

Assessment of risk factor profile in young patients undergoing elective coronary artery bypass grafting surgery in Armed Forces Institute of Cardiology/National Institute of Heart Disease, a tertiary care cardiac facility

Sahrai Saeed[1], Peter M. Nilsson [2]

Dear Madam

Patients with coronary artery disease (CAD) in South Asian countries are often younger and have more aggressive coronary atherosclerosis, higher prevalence of pre-diabetes/insulin resistance, diabetes, abdominal obesity and atherogenic type dyslipidaemia (low HDL cholesterol and high triglycerides), despite lower total cholesterol and blood pressure (BP) levels compared with Europeans.[1] Similarly, ischaemic stroke patients in South Asian countries are also younger and associated with modifiable CV risk factors such as hypertension, diabetes, obesity and smoking.[2] However, applying the commonly used risk assessment tools, which are validated in other non-Asian populations, may underestimate the true risk of cardiovascular (CV) disease in South Asians. In this issue of The Journal of the Pakistan Medical Association, Iqbal et al. presented their experiences from a tertiary heart center from Rawalpindi region.[3] In their study, they included a total of 1270 consecutive patients <50 years (mean age 39.3 years, 66.1% men) who underwent elective coronary artery bypass graft (CABG) surgery over a period of 40 months. The risk factors studied were smoking, hypertension, diabetes, serum cholesterol, family history of CAD and obesity (body mass index [BMI] ≥30 kg/m^2). Hypertension was found in 25.2%, diabetes in 13.3%, obesity in 12.5%, history of CV disease in 17.4% and smoking in 23.9%. The authors concluded that the prevalence of hypertension and obesity were high in their study. However, given the relatively younger age (<50 year) of patients, it may well be that the true burden of above mentioned CV risk factors and disease states in this cohort with established early CAD was even higher than reported. This may be explained as follows:

1. Hypertension

Hypertension was defined according to WHO criteria from 1996 as BP >140/90 mmHg. However, it was not stated how the BP was measured. Of note, the 2018 European Society of Hypertension (ESH) and European Society of Cardiology (ESC) guidelines on hypertension in adults recommend measurement of BP after 5 minutes rest in the sitting position with a correctly sized cuff in the individual participant. The BP is measured three times in 1-minute intervals between the measurements and the average of the last two measurements is taken as the clinic/office BP.[4] A standard definition of hypertension includes previously known (history) hypertension, use of antihypertensive medications or office systolic BP ≥140 and/or diastolic BP ≥90mmHg. Furthermore, 24-h ambulatory BP measurement can differentiate true normotension from hypertension subtypes such as masked hypertension (normal clinic/office BP but elevated out-of-office/home BP), white coat hypertension (elevated clinic/office BP but normal at home) and sustained hypertension (elevated BP both at clinic and home), as well as identify patients with non-dipping BP pattern (<10% decline at night-time) and assess BP control in treated hypertensive patients. 24-h ambulatory BP monitoring is particularly useful in high-risk patients with prevalent stroke, CAD or left ventricular hypertrophy (LVH) on echocardiography or those with chronic kidney disease. Although 24-h ambulatory BP was not part of the protocol, it could probably increase the true prevalence of hypertension, particularly masked hypertension, whose prevalence is less studies in South and Middle Asian patients.

2. Obesity

Overweight and obesity was defined according to the standard BMI categories and a total of 12.5% patients were diagnosed with obesity. Mean BMI of 24.7±5.4 kg/m^2 was normal according to the standard BMI thresholds. However, we know that in South Asian populations, BMI may be normal, but waist circumference (WC) high, reflecting abdominal obesity which is associated with increased risk of CV disease and pre-diabetes/diabetes.[5] Most recently, we presented an overview of fundamental differences in the CV risk assessment of people from Indian sub-continent with particular focus on India, Pakistan and Bangladesh.[1] High WC in Asians may be defined as ≥90 cm in men and

[1]Department of Heart Disease, Haukeland University Hospital, Bergen, Norway; [2]Department of Clinical Sciences, Lund University, Skåne University Hospital, Malmö, Sweden.

Correspondence: Sahrai Saeed. e-mail: sahrai.saeed@helse-bergen.no

≥80 cm in women, while in American and European-Caucasian these cut-offs are ≥102 cm for men and ≥88 cm for women. Indeed, a BMI of at least 30 kg/m^2 for the definition of obesity in white Europeans corresponds to 22 kg/m^2 for South-Asians and 26 kg/ m^2 for black African populations.[6] Hence, applying the standard BMI cut-offs which are validated in whites, and not taking WC into account in South Asians, may lead to underestimation of true prevalence of overweight and obesity and the risk of CV disease.

3. Biomarkers

Studies from the United Kingdom, Scandinavia and New Zealand,[7-10] comparing cardiovascular risk of South Asians with White Europeans, have shown that total cholesterol and LDL cholesterol were often lower in South Asians than in white Europeans, but South Asians tended to have higher triglycerides and lower HDL cholesterol, reflecting a distinct phenotype of atherogenic dyslipidaemia, which is associated with an increased risk of CAD. Furthermore, in the work of Iqbal et al. the information on the family history of CAD was gathered, but the information on familial hypercholesterolaemia, a common cause of premature CAD, was missing. Further, including serum glucose both post-prandial and fasting was very useful for assessing diabetes, but including HbA1C could potentially increase the prevalence of incident diabetes.

Overall, the strength of the study of Iqbal and colleagues is its large sample size, and the consistent findings that patients with established CAD in South Asia most often have clustering of modifiable CV risk factors leading to early coronary atherosclerosis. However, using the appropriate CV risk assessment tools may yield even higher burden of CV risk factors in this relatively young population. The study represents an important contribution to the current literature on the CV health in South Asians, describing a young cohort of stable coronary artery disease who were diagnosed with atherosclerotic CAD undergoing CABG operation. The work of Iqbal and colleagues highlights the importance of optimal control of conventional CV risk factors including diabetes and hypertension, smoking cessation, adopting a healthy lifestyle and physical training to avoid premature vascular events including CAD and stroke. Implementing coronary artery calcium score by cardiac CT in addition to the traditional CV risk factors, particularly in persons with a family history of premature CAD, may further refine CV risk in these patients.

Disclaimer: None.

Conflicts of interest: None.

Funding disclosure: None.

References

1. Saeed S, Kanaya AM, Bennet L, Nilsson PM. Cardiovascular risk assessment in South and Middle-East Asians living in the Western countries. Pak J Med Sci. 2020;36:1719-1725.
2. Sherin A, Ul-Haq Z, Fazid S, Shah BH, Khattak MI, Nabi F. Prevalence of stroke in Pakistan: Findings from Khyber Pakhtunkhwa integrated population health survey (KP-IPHS) 2016-17. Pak J Med Sci. 2020;36:1435-1440.
3. Iqbal M, Iqbal M, Iqbal MA, Pervaiz F, Jamil H, Inam SHA. Assessment of risk factor profile in young patients undergoing elective coronary artery bypass grafting surgery in Armed Forces Institute of Cardiology/National Institute of Heart Disease, a tertiary care cardiac facility. J Pak Med Assoc. 2021; 71:98-100.
4. Williams B, Mancia G, Spiering W, Agabiti Rosei E, Azizi M, Burnier M, et al. 2018 ESC/ESH guidelines for the management of arterial hypertension. The task force for the management of arterial hypertension of the European Society of Cardiology and the European Society of Hypertension. J Hypertens. 2018;36:1953–2041.
5. Narayan KMV, Kanaya AM. Why are South Asians prone to type 2 diabetes? A hypothesis based on underexplored pathways. Diabetologia. 2020;63:1103-1109.
6. Ntuk UE, Gill JM, Mackay DF, Sattar N, Pell JP. Ethnic-specific obesity cutoffs for diabetes risk: cross-sectional study of 490,288 UK biobank participants. Diabetes Care. 2014;37:2500–2507.
7. Kumar BN, Selmer R, Lindman AS, Tverdal A, Falster K, Meyer HE. Ethnic differences in SCORE cardiovascular risk in Oslo, Norway. Eur J Cardiovasc Prev Rehabil. 2009;16:229-234.
8. Bennet L, Nilsson PM. Country of Birth Modifies the Associations of Body Mass and Hemoglobin A1c With Office Blood Pressure in Middle Eastern Immigrants and Native Swedes. J Hypertens. 2014;32:2362-2370.
9. Haas GM, Parhofer KG, Schwandt P. Prevalence of cardiovascular disease risk factors in migrants participating in the PEP Family Heart Study, Nuremberg. Int J Prev Med. 2010;1:19-28.
10. Rabanal KS, Meyer HE, Tell GS, Igland J, Pylypchuk R, Mehta S, et al. Can Traditional Risk Factors Explain the Higher Risk of Cardiovascular Disease in South Asians Compared to Europeans in Norway and New Zealand? Two Cohort Studies. BMJ Open. 2017; 7: e016819.