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Research Letter

High alert! Alarming rise in the Prevalence of cardiovascular risk events among the students of medical profession in India

A B S T R A C T

Cardiovascular disease (CVD) risk events increase at an alarming rate among student of medical profession (SMP) in India. By estimating the prevalence, awareness could be created and further consequences could be prevented at early stage. The prevalence of CVD risk events was found to be 12.4% among SMP in India. Because evidence suggests that at early stage pathophysiological process for CVD begins.

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To the Editor,

The sedentary life styles among the student of medical profession (SMP) give rise to increase in cardiovascular disease (CVD) risk events.[1] They can lead to the increased risk like narrowing or blockage of the arteries in legs, increase risk of circulatory problem, and possibly causing heart disease or stroke.[2] Hence there is an urgent need to estimate CVD risk among SMP. Ankle Brachial Index (ABI) is an indicator of atherosclerosis, vascular calcification or prevalent of CVD risk events. ABI is calculated by dividing the systolic blood pressure measured in the arterial conduits at the level of the ankle by the systolic blood pressure measured in the brachial artery as given by the following equation, ABI = Ankle systolic blood pressure/Brachial systolic pressure.[2] The ABI is used to assess patients for peripheral arterial disease (PAD) as a fall in blood pressure in an artery at the ankle relative to the central blood pressure would suggest a stenosis in the arterial conduits somewhere in between the aorta and the ankle. PAD affects some 10–18% general populations.[3] The majority of patients are asymptomatic and undiagnosed, although intermittent claudication is the primary, and most often only, symptom, over 16 million of the patients with peripheral arterial disease are asymptomatic.[1] As evidence suggests that at early stage pathophysiological process for CVD begins, the risk estimation could create awareness among SMP in India. Hence we aimed to estimate the prevalence of CVD risk events among SMP.

From our preliminary study, the required sample size was found to be 202. We used the formula for estimating proportion ($n = z\alpha^2 P (1 − P)/d^2$; where, $z\alpha = 1.96$; P = 20% [from our unpublished pilot study]; d = 5%) to find sample size, The 116 females and 86 males totaling 202 SMP, aged between 18 and 26 years were included for the cross sectional study by the simple random sampling. The study was done in accordance with ethical guidelines for biomedical research on human subjects, Indian Council for Medical

Research (ICMR), 2006. Purpose, procedure, risks and benefits of the study was explained to them before data collection and assured confidentiality of the collected data. Anthropometrics were measured according to the recommendations of the International Standards for Anthropometric Assessment (ISAK). ABI was measured according to the guidelines of American College of Cardiology/American Heart Association (AHA).[4] As ABI measurements lack protocol standardization which reduces intra-observer reliability,[5,6] all the observations were made by a single observer. We have used automated oscillometric blood pressure measuring device to measure ABI because they have high correlation, r = 0.81 with the gold standard Doppler assisted ABI[7] and to minimize unavoidable human errors.

Normality of collected data was established by Kolmogorov Smirnov test. As the data does not follow normal distribution, descriptive statistics were expressed in median (inter-quartile range [IQR]), 95% confidence interval (95% CI) and range. Non-parametric tests, Mann-Whitney *U* test and Chi-Square test (for categorical variable) were used to analyze. Risk prevalence was reported in percentages (%). Demographics of the collected sample are displayed in Table 1. ABI among SMP has no correlation (spearman's rank correlation), $\rho = 0.05$; p = 0.49 with BMI, no association with smoking status, $\chi^2 = 2.03$; p = 0.14 (Fischer Exact test, p = 0.27) and no association with diabetic status, $\chi^2 = 0.29$; p = 0.14 (Fischer Exact test, p = 1.00). None of them reported to have any ulceration or signs of peripheral arterial insufficiency (asymptomatic individuals). The median (IQR), 95% CI and range of ABI among the SMP were found to be 1 (0.94–1.05), 0.98–1.01 and 0.81–1.23 respectively with no significance difference, p = 0.52 between male and female. 25 out of 202 SMP fall below the prescribed cut-off value (ABI $\leq$ 0.90, as recommended by American Heart Association[4]) for CVD risk events independent of the presence of symptoms PVD in symptomatic individuals. No SMP have ABI $\geq$ 1.40 in our prevalence study. Thus, the overall prevalence of CVD risk events among SMP is found to be 12.4%

Table 1
Demographic characteristics of the student of medical profession (SMP) recruited.

Parameter		Male[*] (n = 86)	Female[*] (n = 116)	p-value
Age (years)		20.2 (19.8–20.6)	19.9 (19.6–20.1)	0.197[**]
Weight (kg)		64.4 (62.2–66.6)	51.1 (49.3–53.9)	<0.001[**]
Height(cm)		172 (171.2–173.7)	158.3 (157.1–159.4)	<0.001[**]
BMI(kg/m^2)		21.6(20.9–22.3)	20.5 (19.7–21.2)	0.027[**]
Smoking status	Smoker	23 (26.7%)	14 (12.1%)	0.008[#]
	Non-smoker	63 (73.3%)	102 (87.9%)	0.27[§]
Diabetic status	Diabetic	1 (1.2%)	1 (0.9%)	0.244[#]
	Non-diabetic	85 (98.8%)	115 (99.1%)	1.00[§]

[*] Expressed in Mean (95% Confidence Interval).
[**] Mann-Whitney *U* test.
[#] Chi-Square test.
[§] Fischer Exact test (>20% cells have excepted count <5).

(25/202), with 12.8% (11/86) male and 12.1% (14/116) female. Hence more than 12% (alarming rate) of SMP has risk of developing CVD, regular fitness programme should be incorporated in their daily life.

Conflict of interest

None of the authors have conflict of interest to declare.

Author's contributions

VH and AJS conceived and designed the study, conducted research, provided research materials, collected and organized data and wrote initial draft of article. DAPE and SY collected data. KN provided the logistic support.

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