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Editorial

Time for a pan-India prevention plan for cardiovascular diseases

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1. Introduction

The latter half of the previous century has witnessed cardiovascular diseases (CVD) race ahead of all other disease groups to become the major cause for global mortality and morbidity. We have evidence to show that urbanization and industrialization have steered the human race away from communicable diseases but toward more chronic lifestyle diseases such as diabetes, hypertension, atherosclerotic cardiovascular disease, and cancer. Four modifiable risk factors, namely tobacco use, unhealthy diet, physical inactivity, and excessive alcohol use, have been implicated in the causation of most of these chronic ailments. Moreover, low- and middle-income countries are currently facing the brunt of the epidemic with 80% of CVD deaths occurring in the developing nations.[1]

2. Urban–rural trends in India

This edition of the Indian Heart Journal features an interesting cross-sectional survey performed in Vellore and its surrounding areas comparing the current prevalence of CVD risk factors with that in the early 1990s.[2] The authors are to be commended for their efforts to study over 12,000 individuals in two phases to understand the trend in two separate rural and urban populations. The key findings of the study were that the rate of diabetes, hypertension, overweight/obesity and alcohol use has increased significantly in both urban and rural settings, with the rural population showing worse trends in each of the risk factors. The fact that people living in remote villages and townships are falling prey to the risks of CVD is alarming and somewhat contrary to the theory of urbanization leading to the rise in non-communicable diseases.

A plausible explanation for this rising trend of CVD risk factors in remote parts of the country is a combination of the lack of awareness, reliable sources of information, and access to healthcare facilities, and to an extent the fatalistic attitude of the people. Having said this, urban populations in India are also facing an increase in risk factors but their access to health-related information and quality healthcare is much better. Moreover, the media and the medical fraternity have joined hands to spread the message of a ''heart-healthy lifestyle'' through newspapers, magazines, television, radio, and Internet. The authors of this editorial are involved in systematic efforts to promote primordial, primary, secondary and tertiary prevention of CVD through public awareness campaigns, lifestyle modification programs, and cardiac rehabilitation programs.

3. Comparing rural populations in India with the global scenario

Table 1 gives a snapshot of the CVD risk factor prevalence in rural parts of India, China, USA and Sweden. Studies have been conducted in Tamil Nadu, Pondicherry, Andhra Pradesh, Kerala, Chandigarh, Haryana, Uttar Pradesh, Maharashtra and Karnataka using the World Health Organization (WHO) and the International Society of Hypertension (ISH) risk prediction charts, WHO STEPS method, or study-based questionnaires.[2–7]

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Table 1 – Prevalence of CVD risk factors (percentage) in rural parts of India and other countries.

Location	Year of study	DM	High BP	High TC	Low HDL	High BMI	Physical inactivity	Unhealthy diet	Tobacco	Alcohol
Vellore[2]	2010–2012	9	15	25	59	31	43	–	23	32
Pondicherry[3]	2011–2012	17	27	26	56	36[a]	9[b]	61[c]	32	53
Andhra[4]	2005	15	30	–	–	22	42	48[d]	27	16
Kerala[5]	2010–2012	8	12	–	–	–	–	–	8	11
Chandigarh, Haryana[6]	2004–2005	–	35	–	–	19	14	–	28	19
India[7] (4 states)	2005–2007	6	21	–	–	23	73	72[e]	12	14
China[8] (Shaanxi)	2007–2008	40	43	31[f]	34	45[g]	–	–	–	–
USA[9] (4 states)	2011–2012	14	50	58	–	25[h]	43	–	25	–
Sweden[10] (Northern)	2009	34	27	17[i]	–	69	24	–	26	–

– data unavailable.
[a] BMI ≥23 kg/m^2.
[b] <600 METS/week.
[c] High salt intake.
[d] Low fruit intake.
[e] Low fruit and vegetable intake.
[f] Raised serum triglycerides.
[g] Larger waist circumference.
[h] BMI ≥30 kg/m^2.
[i] Taking cholesterol medicine.

Anthropometric measurements and physical examination were performed based on international guidelines. However, since definitions for behavioral risk factors are not standardized, there were differences in the criteria applied for risk-stratification even within a single state in India. For instance, physical activity has been measured by self-reported exercise hours per week, by interpreting the daily activities as metabolic equivalents (MET) per week or by the total MET hours per day or by a combination of work-related, recreation-related and travel-related activities (WHO STEPS). Similarly, wide variation exists in the assessment criteria for dietary intake and alcohol consumption. Despite these differences, it is encouraging to see that researchers are focusing on gathering the much-needed local data pertaining to the health status of people residing in rural parts of our country.

While it is obvious that rural India is stifling under the rising prevalence of CVD risk factors, it is also quite clear that this is not a problem unique to India. Rural populations in China, USA and Sweden, just to quote a few, have a higher prevalence of diabetes, hypertension and dyslipidemias than in India (except low HDL which was prevalent in some parts of South India) while the behavioral risk factors are comparatively higher in rural India.[8–10] Interestingly, tobacco use has declined and alcohol consumption has increased in many Indian villages. The impact of psychosocial factors such as chronic stress, depression and anxiety known to play a strong role in the causation of CVD remains to be explored in rural parts of India as well as in developed nations. In addition to urban–rural differences, several studies have also analyzed the influence of socioeconomic status, education level, age and gender on the development of risk factors; addressing the fundamental issues such as poverty, illiteracy, gender inequality and unemployment appear to be key factors in stemming the CVD preponderance of the rural people.

4. Model prevention programs

The formulation of a CVD prevention plan sensitive to the social, cultural and traditional norms of not only urban and semi-urban dwellers but also rural communities is the next big challenge facing the country. A few meaningful attempts have been made to design and execute risk-reduction strategies for rural populations across the globe.

A simplified cardiovascular management program delivered by community health workers with the aid of a smartphone-based electronic decision support system (SimCard trial)[11] in 47 villages in India and China between the years 2011 and 2014 showed promising outcomes in terms of improvement in medication usage, better adherence to follow-up, and reduction in blood pressure. Another innovative mobile health tool to assess and manage CVD has been field-tested in rural Andhra Pradesh (SMARThealth study)[12] by trained village healthcare workers and Primary Health Centre (PHC) doctors and is planned for expansion to 54 villages in South India. With over 23,000 PHCs catering to the health needs of the rural population of India, such programs aimed at training and empowering the local health workers in various levels of CVD prevention are a wise approach to the growing problem.

In the Northern provinces of China where cardiovascular mortality is high, the Primary Care Providers Study[13] has been designed as an intervention strategy delivered by trained village doctors to improve primary care of patients with high risk of CVD. The community-wide Franklin Cardiovascular Health Program established in 1974 in Franklin County, a low-income, rural county in west central Maine, USA, targeting cardiovascular risk factors and behavior changes, documented reductions in mortality and hospitalizations and substantial

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improvements in hypertension control, cholesterol control, and smoking cessation compared to the rest of Maine and other states in USA.[14] The HeartBeat Connections program[15] was developed as part of a population-based demonstration project, aimed at reducing myocardial infarctions in New Ulm region of Minnesota. This project was innovative in that it identified eligible patients using the electronic health records of the region and provided a phone-coaching program combining both behavioral lifestyle coaching and medication management in conjunction with the Hearts of New Ulm (HONU) project. The ''know your numbers'' program,[16] tested in developed countries, has been incorporated in the Atahualpa project in rural coastal Ecuador with an aim to inform people of the CVD risk factors and monitor them to understand the changing trend of CVD, if any.

The paucity of systematic data collection and research studies in India is a major hurdle to the implementation of targeted health promotion programs. A very small proportion of medical practitioners in the country are currently involved in research activities, probably due to lack of time, interest, and skills. More so, the hurdles of working in remote villages in a large country like ours are so many that any small attempt has to be encouraged and supported. More and more medical and allied professionals should engage in scientific research and be open to collaborations and teamwork in order to better address the growing health needs of the people in a rapidly changing environment.

In conclusion, the alarming rise in CVD risk factors has percolated all geographic locations, socioeconomic strata and educational levels. An exponential rise in lifestyle disorders, particularly CVD, calls for urgent and effective prevention strategies that will work simultaneously for the rich and the poor, the city and the village dwellers, the educated and the illiterate, the young and the old, and for men and women alike. Daunting as it may seem, it is the need of the hour. It is in the hands of the healthcare professionals and policymakers to work together to control the CVD epidemic, arguably the biggest health challenge facing India at the moment.

Conflicts of interest

The authors have none to declare.

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