

Commentary

Hypertension & pre-hypertension in developing countries

Hypertension is reported to be the fourth contributor to premature death in developed countries and the seventh in developing countries¹. Recent reports indicate that nearly 1 billion adults (more than a quarter of the world's population) had hypertension in 2000, and this is predicted to increase to 1.56 billion by 2025². Earlier reports also suggest that the prevalence of hypertension is rapidly increasing in developing countries^{3,4} and is one of the leading causes of death and disability in developing countries.

The epidemiology of hypertension, in terms of its importance as a risk factor for cardiovascular diseases, continues to be a major area of research. In 1913, it was reported that patients with elevated blood pressure (BP) tend to die prematurely, while in 1931 high BP was a common problem in clinical practice in Britain^{5,6}. A meta-analysis of hypertension prevalence rates in India⁷ demonstrated a significant increase in the prevalence of hypertension. The increase was significantly higher in urban than in rural populations and the prevalence of hypertension was higher in urban compared to rural areas. The prevalence rates in India are now almost comparable to those in the USA^{8,9}. The prevalence of hypertension varies considerably from one region of India to another. Yet no nationwide epidemiological studies to determine the prevalence of hypertension have been carried out. Sporadic studies from different parts of the country provide data on the epidemiology of hypertension in India. Chopra & Chopra¹⁰ reported the first epidemiological study on hypertension in urban north India in 1942, following which, many studies in urban and rural areas of India have been carried out. Subsequent studies have shown a steadily increasing trend of hypertension in India¹¹.

Indian urban population studies in the mid-1950s used the standardized World Health Organization (WHO) guidelines (hypertension diagnosed if systolic

BP ≥ 160 and/or diastolic BP ≥ 95 mm Hg)¹², have shown increasing trend in hypertension prevalence. Studies from Agra (1963)¹³ and Rohtak (1978)¹⁴ using WHO criteria showed prevalence 4.35 and 6.43 per cent respectively. A majority of the surveys in urban areas using the criteria of $\geq 160/95$ mmHg, showed a prevalence rate of 6-13 per cent, except a few, which reported a prevalence of 15 per cent^{15,16}. The Jaipur Heart Watch study¹⁷ and the Chennai Urban Rural Epidemiology Study (CURES)¹⁸ reported the prevalence of hypertension to be 37 and 20 per cent using the JNC- VI/VII guidelines (hypertension diagnosed if systolic BP ≥ 140 and/or diastolic BP ≥ 90 mm Hg)^{19,20}. The recent inclusion of the term 'pre-hypertension' (defined as the blood pressure range of 120 to 139 mm Hg systolic or 80 to 89 mm Hg diastolic) heralds the onset of arterial hypertension and thus may be considered a starting point in the cardiovascular disease continuum. Moreover, pre-hypertension has been associated with higher cardiovascular risk and is estimated to decrease the average life expectancy by as much as five years^{20,21}. However, this term is highly controversial and many people suggest dropping this term. Indeed there are some who do not even like the idea of having an arbitrary cut-off point to define 'hypertension' as they feel that BP like cholesterol is a continuum of risk²⁰.

In the light of published data suggesting increase in prevalence of hypertension in developing countries, the study by Yadav *et al* in this issue²² conducted in 1112 adults (age >30 yr) explores the prevalence of pre-hypertension and hypertension, as well as their association with cardiovascular risk factors, in an Indian upper socio-economic population residing in an urban colony in the city of Lucknow, north India. The authors have reported a similar age and sex adjusted prevalence of hypertension and pre-hypertension (32%) in their population. The prevalence of hypertension and pre-

hypertension were higher in males when compared to females, an increasing trend was observed in both males and females with increasing age. Increasing age, body mass index, waist-hip ratio and the presence of diabetes or impaired glucose tolerance (IGT) were independent risk factors for both pre-hypertension and hypertension. The prevalence rate of hypertension reported in this study was similar to that reported among employees aged 20-59 yr of a large industry near Delhi (30%)²³. However, the prevalence rate of pre-hypertension was 44 per cent in the Delhi industrial population and 36.1 per cent in the Chennai urban population¹⁸, which are much higher than that reported in this study (32%). Very few studies have looked at the prevalence of pre-hypertension in India. Recently, two studies conducted in the Chinese (n=15,540) and Turkish (n=4809) population reported an overall prevalence of pre-hypertension to be 21.9 and 14.5 per cent respectively^{24,25}. Compared to other population, the pre-hypertension prevalence rate is higher among affluent urban Indians. As rightly commented by Joshi & Parikh²⁶, with the current rate of hypertension, India will have the largest number of people with hypertension in the world, with the potential of becoming the 'Hypertension capital of world!'

Data of study by Yadav *et al*²² suggest that the prevalence of hypertension in the youngest age group (30-39 yr) was 13.7 per cent and increased to a peak of 64 per cent in the age group 60-69 yr, while prevalence of pre-hypertension was highest in the group 30-39 yr (36%). A similar prevalence of pre-hypertension in the same age group (35.4%) has been reported by our group in the Chennai urban population¹⁸. The present finding, of very high prevalence rates of pre-hypertension in younger age group is alarming, as they may develop hypertension as this population ages. The prevalence of hypertension will increase even further unless broad and effective preventive measures are implemented at this stage as India is a vast country with a heterogeneous and young population.

Thus, it is clear that the prevalence of hypertension between three and six decades in India, has increased by about 30 times among urban residents and by about 10 times among the rural residents. Various factors might have contributed to this rising trend, attributable to several indicators of economic progress such as increased life expectancy, urbanization and its attendant lifestyle changes including increasing salt intake and the overall epidemiologic transition India is experiencing currently. Epidemiological studies to assess the prevalence of hypertension are urgently needed in

developing countries like India to determine the baseline against which future trends in risk factor levels can be assessed and preventive strategies planned to promote health among all sections of the populations including reducing obesity, increasing physical activity, decreasing the salt intake of the population and a concerted effort to promote awareness about hypertension, its risk factors, and risk behaviours. These efforts have the potential to reduce the emergence or minimize the prevalence of pre-hypertension and hypertension in different regions of India.

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