Hypertension Trends in Asia
Yan Ting Chua, Weng Kin Wong, Satya P. K. Gollamudi, Christopher Cheang Han Leo
Division of Nephrology, Department of Medicine, National University Hospital, 1E Kent Ridge Road, Level 10 NUHS Tower Block, Singapore 119228

Abstract

Hypertension is an often silent yet modifiable risk factor of cardiovascular morbidity and mortality. Despite increasing recognition of its adverse health impacts, global prevalence remains on the rise and hypertension control remains suboptimal. A similar trend has been observed in South-East Asia, particularly in less-affluent areas, where hypertension prevalence is rising but awareness and control rates are dismal. Contributory factors identified include accessibility of healthcare, different health-seeking behaviour, lifestyle factors such as dietary salt intake, and lack of individual recognition of potential downstream complications. Strategies employed in the fight against hypertension in South-East Asia will need to address these different needs, taking into consideration the interplay of differing socioeconomic status and education level amidst varying racial and cultural beliefs and traditions.

Key words: Hypertension, Blood pressure, Asia, Cardiovascular

Introduction

Hypertension, often touted as a silent killer, has long been recognized as major modifiable risk factor for cardiovascular morbidity and mortality. Death from complications of hypertension including coronary artery disease and stroke was estimated to account for 9.4 million deaths worldwide every year.[1] In Asia, an estimated 1 in 3 people is affected by hypertension, slightly lower than the global average of 40%.[1] In Southeast Asia alone, hypertension has been estimated to claim 1.5 million lives each year.[2]

The clinicopathological impact of hypertension on end-organ damage and mortality may be even more pertinent in the Asian population. Not only is hypertension a leading cause of chronic kidney disease in Asia,[3] association between elevated blood pressure and hemorrhagic strokes may also be stronger in Asians.[5] Even elevated BP at pre-hypertension levels may be associated with increased cardiovascular morbidity.[4]

While hypertension control has been well-studied in the Western population, data in Asia have been scarce. The differences in sociocultural, economic, and political climate in Asia and the vast heterogeneity in race and affluence within Asia suggest that Western data and strategies may not be directly applicable to the Asian context.

This article seeks to describe trends in hypertension prevalence, control, and awareness in Asia, with a particular emphasis on Southeast Asia, and seeks to identify potential areas where strategies for BP control may be employed.

Trends in Definition of Hypertension

The definition of hypertension has traditionally been defined as a systolic BP (SBP) of 140 mmHg and above and/or a diastolic BP (DBP) of 90 mmHg and above.[6] However, guidelines have gradually been revised to reflect a stepwise increase in cardiovascular risk as BP increases above normal levels.[7] Since 2004, the Joint National Committee (JNC) on Prevention, Detection, Evaluation, and Treatment of High BP (JNC) introduced a new classification including the term “prehypertension” for those with BPs ranging from 120 to 139 mmHg systolic and/or 80–89 mmHg diastolic.[6] In 2017, the American College of Cardiology/American Heart Association (ACC/AHA) task force lowered cutoff for hypertension to include those with BPs from 130 to 139/80 to 89 mmHg.

Guidelines on target BP differ. JNC 8 recommends for a target BP of <150/90 mmHg for those aged 60 years and
older and <140/90 mmHg for those with age younger than 60 years or comorbidities such as diabetes or chronic kidney disease.\[10\] The ACC/AHA guidelines suggest for a lower BP target of <140/90 mmHg for those with no history of cardiovascular disease and atherosclerotic cardiovascular disease (ASCVD) risk of <10% and a lower target of <130/80 mmHg for those with a 10 year ASCVD risk of 10% or higher.\[9\]

Certain countries in Asia have adopted stricter BP targets. In Singapore, latest guidelines in 2017 recommend a target of <150/90 mmHg for those aged 80 years and older, <140/80 mmHg for those with diabetes mellitus, <130/80 mmHg for those with moderate-to-severe albuminuria, and <140/90 mmHg for other patients.\[10\] Guidelines in Malaysia are similar, with a target BP of <150/90 mmHg for those aged 80 years and older, <140/80 mmHg for those with diabetes, but <130/80 mmHg for those with diabetes who are young, and <140/90 mmHg for other patients.\[11\] BP targets in Taiwan are stricter. The Taiwan Hypertension Society recently revised its guidelines in 2017 to a lower BP target of <120 mmHg of automated office BP measurement for patients with coronary heart disease, chronic kidney disease, and elderly patients aged 75 years and above.\[12\]

**Trends in Hypertension Prevalence**

Over the years, global hypertension burden has risen from 600 million in 1980 to 1 billion in 2008\[1\] and has been predicted to increase to 1.56 billion by 2025.\[13\] This increase not only reflects population growth but also rises prevalence. Prevalence of hypertension in adults worldwide was 26.4% in the year 2000 and projected to rise to 29.2% by the year 2025.\[13\]

In Asia, prevalence of hypertension between the years 2008 and 2015 has been largely similar to the global average. Nationwide surveys have found prevalence to be 48.3% in Brunei,\[14\] 15.3% in Cambodia,\[15\] 33.4% in Indonesia,\[16\] 24.9% among men and 20% among women in Laos,\[17\] 35.3% in Malaysia,\[18\] 31% in males and 29% in females in Myanmar,\[19\] 23.5% in Singapore,\[20\] 19.1% in Thailand,\[21\] and 25.1% in Vietnam.\[22\]

Trends in hypertension prevalence have not been consistent across SEA nations. In India, the prevalence of raised BP rose from 5% in the 1960s to 12% in the 1990s, to >30% in 2008.\[23\] In Indonesia, the prevalence rose from 8% in the year 1995 to 32% in the year 2008 and 33.4% in the year 2015.\[16,23\] Similarly, in Myanmar, the Ministry of Health reported an increase in hypertension prevalence, from 18% to 31% in males, and from 16% to 29% in females during 2004–2009.\[23\] In Singapore, however, the prevalence of hypertension fell from 27.3% in 1998 to 24.9% in 2004 and 23.5% in 2010.\[20\] In Malaysia, prevalence remained largely stable at 34.6% in 2006, 33.6% in 2011, and 35.5% in 2015.\[18\]

The trend in the shifting of hypertension burden from higher income countries to lower income countries has also been suggested in a recent analysis. A pooled global age-standardized prevalence of raised BP found that, over the past four decades, mean BP decreased from 1975 to 2015 in high-income Western and Asia Pacific countries. Highest worldwide BP levels have shifted from high-income countries to low-income countries in South Asia and Sub-Saharan Africa.\[24\]

While age-standardized prevalence may have fallen in higher income Asian societies, the overall burden of hypertension is nevertheless projected to rise. Among various reasons, significant contributions include aging population, urbanization, and also potential shifts in hypertension definition.

Not only is burden of hypertension in the elderly population higher but also BP control tends to be poorer. In a study of the elderly Singaporean population aged 60 and above, nearly 3 of 4 (73.9%) were found to have hypertension.\[25\] The problem of expected rapid aging in Asian populations means that hypertension burden is likely to accelerate. Within the developing world, the prevalence of hypertension in rural areas is 2–3 times lower than those in urban areas in Asia.\[26\] A similar finding has also been described in Vietnam and Indonesia.\[16,22\]

Urbanization and adoption of western lifestyle and diet have been described as major contributors.\[21\]

Adoption of the new ACC/AHA definition of hypertension, which lowers cutoff of hypertension to that of BP 130/80, would lead to marked increase in hypertension prevalence worldwide. In developing countries, where a significant proportion of population resides in rural areas with limited access to health care, hypertension may often go undiagnosed. Even in event that hypertension is diagnosed, recognition of the imperative to control BP may not be a priority due to the relatively asymptomatic nature of the disease. Hypertension in Asia will continue to pose a growing problem. It is estimated that the changes in definition would label 63% of those in the United States and 55% of those in China aged 45–75 years old as having hypertension, representing an increase in prevalence of 26.8% in the US and 45.1% in China, accounting for 337 million more hypertensive patients just in these two countries alone.\[27\] In Cambodia, the prevalence of those with prehypertension was close to twice that of those with hypertension.\[23\] A change in definition would greatly increase the global hypertension burden.

**Awareness of Hypertension**

Awareness of prior diagnosis of hypertension also varies widely between the Southeast Asian nations. Awareness of hypertension is highest in Singapore at 73.7%,\[28\] followed by Thailand and Vietnam at 48.4%,\[21,25\] and lowest in Myanmar at 27.8%.\[29\] While awareness to hypertension has increased in Asian countries such as Indonesia, Malaysia, Myanmar, and Singapore levels still fall far short of awareness levels in Western nations such as the US (81%), Canada (83%), and England (65%).\[28\]

**Treatment and Control of Hypertension**

Treatment rates were generally low and varied widely across the Southeast Asian nations. In Malaysia, 83.2% of hypertensive patients were on treatment,\[29\] 61% in Vietnam,\[30\] and 42% in Thailand.\[31\] In Laos,\[37\] <20% of hypertensive patients were on...
treatment, and in Indonesia, only 11.5%. BP control, defined as a SBP of <140 mmHg and DBP of <90 mmHg, was also low among these. Proportion of those with good BP control was highest in Singapore at 67.4% of all hypertensive patients and 69.1% among those patients on treatment. BP control rates were lowest in Indonesia and Thailand at 14.3% and 14.9%. Even among those on treatment in Vietnam, only 36.3% had well-controlled BP.

BP control rates, though low, have shown encouraging trends in higher income countries in Southeast Asia such as Singapore and Malaysia, which have seen increase in BP control from 49.5% in 2004 to 67.4% in 2010 and 27.5% in 2006 to 37.4% in 2015, respectively.

However, there remains much room for improvement in BP treatment and control. Western nations in the US Canada and England have hypertension treatment rates ranging from 51% to 80% and control ranging from 27% to 66%.

Factors Resulting in Poor Hypertension Control

Hypertension control in Southeast Asia, especially in developing countries, is poor. Western-based studies have cited reasons including race, lifestyle factors, and access to health care. The main driving factors for poor hypertension control likely vary between low- and high-income groups within Southeast Asia. In developing countries, where a significant proportion of population resides in rural areas with limited access to health care, hypertension may often go undiagnosed. Even in event that hypertension is diagnosed, recognition of the imperative to control BP may not be a priority due to the relatively asymptomatic nature of the disease. In higher income countries in Southeast Asia such as Singapore and Malaysia which exhibit higher rates of awareness and control of BP, the main driving factor behind poor control likely lies in lifestyle factors and health-seeking behavior. Increasing trends in diseases of affluence such as obesity and diabetes have been identified as key risk factors. Of note, the attributable risk of hypertension begins at lower body mass index levels in Asians compared to Caucasians.

Dietary salt intake, a strong risk factor for hypertension, also contributes significantly to the poor control of hypertension in Southeast Asia. Salt intake in Southeast Asia is high, ranging 10–17 g a day, which is 2–3 times as high as the recommended daily salt consumption of <5 g/day by the World Health Organization. Unlike in Europe and North America where sodium intake is derived mainly from food eaten away from home, majority of salt in Southeast Asia comes from tablet salt and condiments such as monosodium glutamate often used in home-cooked meals. Various countries such as Indonesia and Thailand have adopted mandatory food labeling with mixed results due to challenges with the development of relevant alternative products and low consumer demands. In Singapore, the Health Promotion Board has been collaborating with local science expertise and industry partners in developing “healthier salt” and food with lower sodium content. However, the key to addressing the issue in dietary salt intake lies not in just implementation of single measures or solutions. In Finland and the United Kingdom, where programs have successfully achieved a significant reduction in salt consumption, factors that contributed to success identified were a combination of strong leadership and policies, technological support for food product reformulation, food nutrition labeling, promotion of consumer awareness, and monitoring of progress by frequent surveys.

Addressing dietary salt intake will require a concerted effort among various key stakeholders including the government, industry players, and consumers.

While information regarding adherence to antihypertensive medication in Southeast Asia is limited, available data suggest significant variability ranging 34–78%. A Vietnamese study revealed an awareness of complication risk, medication side effects, and absence of hypertension symptoms as key determinants affecting medication adherence. A systematic review evaluating medication adherence factors for hypertension in developing countries cited other factors such as cost barriers, irregular follow-ups, and competing availability of traditional herbal remedies. When it comes to the treatment of hypertension, a key challenge especially among the less educated is the reconciliation of the disease’s asymptomatic nature and its downstream life-threatening complications. Moreover, the undertaking of educating about the importance of hypertension control in the Southeast Asian context is further complicated by differing pathogenetic models in the fields of traditional, complementary, and alternative medicine pervasive in the region. Addressing patients’ knowledge, attitudes, and perceptions in hypertension is likely key in improving adherence rates, and culture and context-tailored national strategies will be necessary. In terms of medication side effects deterring medication adherence, angiotensin-converting enzyme inhibitors, a common class of medication used in the treatment of hypertension, has been associated with higher incidence of a cough among Chinese populations. It is, thus, crucial that such pharmacogenetic variations are taken into consideration and managed appropriately in the treatment of hypertensive Asians.

Conclusion

Hypertension in Asia will continue to pose a growing problem. Increasing urbanization and westernization, an aging population, and the lowering of hypertension definitions are key factors driving the increasing disease burden. In terms of disease treatment and control, while there have been encouraging trends of improving awareness, treatment rates, and control in more developed countries such as Singapore and Malaysia, the challenge to emulate nation-wide strategies critical in achieving these goals in less developed countries remains. Socioeconomic issues of stark income inequality, relatively underdeveloped medical systems, and infrastructure and cultural influences affecting diet and health-seeking behaviour will have to be addressed. Data regarding hypertension trends in Asia, especially that concern less developed countries, also remain limited. More
comprehensive and up-to-date data are necessary for a more accurate appraisal of the situation or hypertension in this region and to guide future strategies and measures in better improving the state of disease control.

References

30. World Health Organization, Regional Office for South-East Asia. Sodium Intake and Iodized Salt in the South-East Asia Region.
India: World Health Organization, Regional Office for South-East Asia; 2014.


34. Board HP. HPB Declares War on Salt: Singapore Residents Exceed Daily Recommended Salt Consumption by 60%. Singapore: Health Promotion Board Singapore; 2011.


How to cite this article: Chua YT, Wong WK, Gollamudi SPK, Leo CH. Hypertension Trends in Asia. Hypertens 2018;4(1):84-88.

Source of support: Nil, Conflict of interest: None