Early Diagnosis of Secondary Hypertension in South Asia: A Public Health Imperative

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ABSTRACT

Hypertension is a major noncommunicable disease in South Asia, contributing significantly to cardiovascular morbidity and mortality. While essential hypertension forms the bulk of cases, a substantial proportion- estimated around 10%- is attributable to secondary hypertension. These cases are often underdiagnosed, particularly in resource-limited settings. Failure to detect and treat secondary causes early leads to resistant hypertension, target organ damage, and increased health care costs. This article emphasizes the critical need for awareness, early diagnosis, and structured management of secondary hypertension in South Asia. We propose policy-level interventions and region-specific solutions to address the systemic gaps and recommend an integrated, multidisciplinary approach.

Keywords: Endocrine hypertension, hypertension, public health policy, renal hypertension, resistant hypertension, secondary hypertension, South Asia, World Hypertension Day

Hypertension represents a significant public health challenge and is a primary contributor to cardiovascular disease, morbidity, and premature deaths globally[1,2]. Approximately 1.13 billion individuals- about 1 in 6 people worldwide- suffer from hypertension[3]. The South Asian region faces a particularly heavy burden due to factors like demographic shifts, urbanization, genetic factors, and lifestyle changes[2]. Despite increasing awareness, fewer than 20% of those with hypertension successfully manage their condition[4]. This inadequate management results in severe consequences, accounting for over 9.4 million fatalities annually[5]. Although most attention is directed toward essential hypertension, secondary hypertension is also a considerable clinical and economic concern, frequently overlooked due to insufficient suspicion (missed or underdiagnosed), and lack of diagnostic resources[6].

Secondary hypertension results from identifiable and often correctable conditions like renal parenchymal diseases, renovascular disorders, primary aldosteronism, pheochromocytoma, Cushing's syndrome, and obstructive sleep apnea. Early identification is essential as many of these causes are reversible or curable, which distinguishes them from primary hypertension[6,7].

SOUTH ASIAN PERSPECTIVE

Hypertension affects approximately 30% of adults in South Asia, with the prevalence exceeding 50% among those over 60 years old[2,8]. As per recent Demographic and Health Surveys (DHS) data of South Asian countries, the hypertension rate is 37.4% in India, while it is 25.1% in Bangladesh and 18.4% in Nepal[8]. Recent researches suggest that 5% to 15% of hypertension cases may be secondary; however, the high rate of underdiagnosis persists due to limited access to specialized health care. The presence of high resistant hypertension rates in the region indicates that there are likely many undiagnosed secondary causes[9].

General physicians and primary health care providers have limited awareness of the need to exclude secondary hypertension. Diagnostic tools like the plasma aldosterone-renin ratio, renal artery Doppler, or overnight

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dexamethasone suppression tests are not consistently accessible throughout South Asian nations. Additionally, health-seeking behaviors tend to be delayed because of out-of-pocket costs and insufficient public health literacy[6-9]. Table 1 depicts the common causes of secondary hypertension in this region with key diagnostic clues.

CURRENT CHALLENGES IN SOUTH ASIA

Numerous cases of secondary hypertension go undetected because blood pressure (BP) readings are often taken sporadically and based on symptoms[6,7]. There is a noticeable absence of clinical algorithms and tools for recognizing red flags at both primary and secondary care levels. Additionally, general practitioners and primary care providers typically lack systematic training in identifying and managing secondary hypertension. The referral networks to specialists such as nephrologists, endocrinologists, and cardiologists are often disjointed. Furthermore, access to tertiary-level diagnostic services is largely restricted to urban areas, leaving rural and semi-urban regions with limited options. Insurance coverage in this region frequently does not extend to advanced diagnostic procedures for identifying secondary causes. Table 2 illustrates the challenges within the health system related to the early diagnosis of secondary hypertension.

SOLUTIONS AND STRATEGIC INTERVENTIONS

Primary Care Training and Screening Protocols

Implement screening protocols based on red flags in primary care environments. Utilize mobile applications or flowcharts to assist health care providers in identifying and investigating potential secondary causes of hypertension. Additionally, it is essential to integrate training modules on secondary hypertension into both MBBS/MD curricula and Continuing Medical Education (CME) programs[10,11].

Table 1. Common Causes of Secondary Hypertension in South Asia and Key Diagnostic Clues

Etiology	Prevalence estimate (%)	Red flags/Diagnostic clues	Recommended initial tests
Renal parenchymal disease	3%-5%	Young onset, proteinuria, elevated creatinine	Serum creatinine, urine protein, renal USG
Renovascular hypertension	1%-3%	Sudden BP rise, abdominal bruit, flash pulmonary edema	Renal Doppler, CTA/MRA renal arteries
Primary aldosteronism	1%-5%	Hypokalemia, resistant HTN, adrenal mass	Serum potassium, plasma aldosterone-renin ratio
Pheochromocytoma	<1%	Episodic HTN, palpitations, headache, diaphoresis	Plasma/urinary metanephrines, imaging
Cushing's syndrome	<1%	Central obesity, striae, proximal muscle weakness	Overnight dexamethasone suppression test
Obstructive sleep apnea	2%-4%	Daytime sleepiness, snoring, obesity	Polysomnography

USG = Ultrasonography; BP = Blood pressure; CTA = CT angiography; MRA = Magnetic resonance angiography; HTN = Hypertension.

Table 2. Health System Challenges in the Early Diagnosis of Secondary Hypertension

Challenges	Details	Impact
Diagnostic infrastructure	Lack of access to endocrine, renal imaging, and hormone assays	Delays in diagnosis; increases costs and complications
Human resources	Undertrained primary care workforce	Low detection rates; inappropriate treatment
Awareness and education	Poor patient and provider awareness of secondary hypertension	Delayed care-seeking and referrals
Health financing	Out-of-pocket expenses for key diagnostic tests	Catastrophic health expenditures, poor follow-up
Data and research gaps	Absence of registry-based or cohort data on secondary hypertension	Hinders targeted policymaking

Table 3. Proposed Policy-Level Interventions for South Asia

Policy Area	Intervention	Outcome
Clinical guidelines	National adoption of secondary hypertension work-up protocols	Standardized diagnosis and treatment approach
Workforce development	Compulsory CME and fellowship opportunities in hypertension diagnostics	Improved clinical suspicion and early intervention
Diagnostics infrastructure	Government-subsidized panels (renin-aldosterone, cortisol, Doppler) at district level	Increased access to advanced diagnostics
Digital health	Hypertension EHR integration with decision support for secondary causes	Better tracking and referrals
Insurance reforms	Coverage for secondary hypertension tests under national health schemes	Reduced out-of-pocket expenses

CME = Continuing Medical Education; EHR = Electronic health record.

Diagnostic Centers and Referral Networks

Create specialized "Hypertension Diagnostic Hubs" within district hospitals, equipped to conduct renal Doppler ultrasound, hormone assays, and imaging studies. Develop telemedicine-supported referral networks to facilitate access to tertiary care centers for comprehensive evaluations[12,13].

Public Awareness Initiatives: Incorporate information about red flags for secondary hypertension into the National Hypertension Control Program, such as campaigns using messaging like "High BP and Low Potassium? Investigate the Cause". Regional language information, education, and communication (IEC) materials alongside media outreach can be utilized on earmarked days such as World Hypertension Day, to boost awareness[14,15].

Table 3 outlines several proposed policy changes aimed at enhancing the early detection of secondary hypertension in this region.

CALL TO ACTION

We call on policymakers, professional organizations, and health care leaders throughout South Asia to incorporate secondary hypertension evaluations into national health initiatives, allocate funding for crucial diagnostic tools and awareness campaigns, and provide training for frontline workers to adopt a comprehensive approach that goes beyond mere statistics. By implementing these collaborative and multifaceted strategies, we can embrace the World Hypertension Day theme for the year 2025[16] - "Measure Your Blood Pressure Accurately, Control It, Live Longer" - while also emphasizing a vital message for our region: "If It's Unusual, It's Secondary".

CONCLUSION

It is crucial for South Asia to focus not only on diagnosing hypertension but ensuring accurate diagnoses. Although secondary hypertension is rarer than essential hypertension, failing to identify it can lead to greater risks and treatment opportunities. By implementing organized protocols, training health care providers, improving diagnostic access, and initiating awareness initiatives, health systems in South Asia can transition from late diagnosis to proactive detection and treatment.

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