

Postprint of Recommendations on Hypertension Prevention and Diagnosis-Treatment Models in China

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Abstract

Hypertension ranks as the foremost chronic disease both globally and in China, with its cardiovascular and cerebrovascular complications serving as the leading cause of death among Chinese residents. Recent international research has consistently demonstrated that community-based prevention and treatment models for hypertension constitute an effective pathway to improving control rates. Community intervention studies conducted in China during the 20th century, which primarily emphasized health education, yielded significant achievements yet failed to achieve nationwide dissemination. In the current century, China has also pursued relevant research on hypertension prevention and treatment models; however, substantial deficiencies remain in hypertension management, necessitating the active exploration of prevention and treatment models suited to China's national context to enhance hypertension control rates.

Full Text

Suggestions on China's Model of Prevention and Treatment of Hypertension

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Abstract

Hypertension is the leading chronic disease both globally and in China, with its cardiovascular and cerebrovascular complications representing the foremost

cause of death among Chinese residents. Recent international research consistently demonstrates that community-based prevention and treatment models constitute an effective pathway to improve hypertension control rates. During the last century, China conducted community intervention studies primarily focused on health education, which achieved remarkable results but were never widely implemented nationwide. Although China has also carried out relevant research on hypertension prevention and treatment models this century, numerous deficiencies persist in current hypertension management. Therefore, we must actively explore prevention and treatment models suited to China's national conditions to improve hypertension control rates.

Keywords: hypertension; prevention; treatment; model; control rate

1. Current Status of Hypertension Prevention and Treatment in China

Hypertension ranks as the number one chronic disease worldwide and in China, with its cardiovascular and cerebrovascular complications serving as the leading cause of death among Chinese residents. However, the status of hypertension prevention and treatment in China remains concerning. The country is currently undergoing rapid economic transition, accompanied by dramatic changes in lifestyle and behavioral patterns, accelerated population aging, and a consistently steep upward trend in chronic diseases. According to the 2008 China National Diabetes and Metabolic Disorders Study, the hypertension control rate was 26.6%. Wang et al. analyzed 46,024 participants in a national survey and found that the prevalence of hypertension among Chinese adults was 29.6%, while the control rate was only 8.2%. Another study covering 11 provinces with over 50,000 participants revealed that among residents aged ≥ 35 years, the hypertension prevalence reached 33.6%, with a control rate of merely 3.9%. Li et al.'s research on nearly 1.7 million adults showed a national hypertension prevalence of 41.9%, with a control rate of only 11.1%. These studies indicate significant regional variations in hypertension prevalence and control across China. Our research group's previous experience suggests that lifestyle factors and climate in Northeastern China differ substantially from those in Southern regions, contributing to higher hypertension prevalence in Northeastern populations. All evidence demonstrates that achieving blood pressure targets can reduce cardiovascular events, making strengthened community-based hypertension prevention and treatment essential for improving population-level control rates in China.

2. Early Exploration of Domestic and International Hypertension Prevention Models

International research has long indicated that community-based hypertension prevention and treatment models effectively improve control rates. Finland's

North Karelia Hypertension Control Project implemented community-level interventions targeting risk factors, including public education and organized health services, which significantly increased hypertension control rates among both men and women and reduced hypertension prevalence. During the same period, the U.S. Stanford Five-City Project also employed community-based patient education through newspapers, radio, and printed materials, resulting in significant reductions in participants' systolic and diastolic blood pressure. In China, Professor Wu Yingkai and colleagues conducted community intervention studies in 1988 focusing primarily on health education, which also achieved favorable outcomes. However, despite these successes, such models were never widely promoted.

3. Recent Research on Hypertension Prevention and Treatment Models

Recent international research has placed greater emphasis on community-based hypertension management, generating high-quality evidence aimed at improving hypertension management and control rates through widespread implementation. An Argentine randomized controlled trial [12] enrolled 1,432 hypertensive patients in a community health worker-led comprehensive intervention including health education, blood pressure target monitoring, physician education, and text message reminders, compared with usual care. After 18 months, the intervention group showed systolic and diastolic blood pressure reductions of 19.3 mmHg and 12.2 mmHg respectively, significantly greater than the control group's 12.7 mmHg and 6.9 mmHg reductions. The intervention group's control rate increased from baseline to 72.9%, demonstrating that comprehensive management measures are effective even in resource-limited settings.

Another U.S. study [13] randomized 319 black male hypertensive patients from barbershops into intervention and control groups. The intervention involved trained pharmacists providing prescriptions at barbershops, lifestyle counseling, and regular review with hypertension specialists and primary care physicians, while the control group received only lifestyle encouragement from barbers. After six months, the intervention group's average systolic pressure decreased by 27 mmHg with a 63.6% control rate, compared to the control group's 9.3 mmHg reduction and 11.7% control rate.

The SimCard study [14], a China-India collaborative cluster-randomized controlled trial, enrolled 2,086 high cardiovascular risk patients from 47 villages. The intervention group received smartphone app-based management guided by community health workers, providing standardized hypertension treatment and aspirin therapy, while the control group received usual care. Results showed the intervention group achieved a 24.4% improvement in overall medication adherence (26.6% in China, 25.5% in India) and a 4.1 mmHg reduction in systolic pressure, highlighting the effectiveness and importance of comprehensive management models.

Additionally, the World Health Organization's HEARTS management program is being promoted in China, offering standardized protocols suitable for primary-level hypertension management. These efforts will enrich China's community-first hypertension management model.

4. Discussion on China's Hypertension Prevention and Treatment Model

China's hypertension prevention and treatment efforts remain a formidable task. However, through collaborative efforts between primary care and tertiary hospital physicians, substantial improvements in hypertension control rates are achievable, potentially leading to an inflection point in cardiovascular disease incidence. China has conducted numerous explorations in hypertension prevention and treatment models, including our research group's low-cost comprehensive intervention studies in rural Northeast China, the "three-in-one" management model in Zhejiang, the Kailuan Coal Mine functional community management model, the Shanghai Minhang District hypertension management project, and family doctor contract services. Despite these achievements, multiple barriers persist in current hypertension management, particularly the lack of effective community-centered prevention and treatment models.

The most critical factor limiting China's hypertension prevention effectiveness is the failure to establish an effective community-centered model. The current hospital-dominated approach cannot achieve a prevention-first strategy. Urgently needed is integration of existing pharmaceutical and management protocols to form a community-centered hypertension prevention and treatment model tailored to China's national conditions. The fundamental method to improve control rates is transitioning from a hospital-dominated management system to a community-first diagnosis and treatment system. The National Cardiovascular Disease Center has established a Primary Hypertension Management Office dedicated to developing national primary hypertension guidelines, training, monitoring, evaluation, and health education. Our research team is also conducting nationwide studies on rural hypertension management models, implementing comprehensive interventions at multiple levels including social insurance, village doctor training, and regular patient education to improve control rates in rural areas.

In 2015, the General Office of the State Council and the National Health and Family Planning Commission (now National Health Commission) issued guidelines requiring the gradual establishment of a tiered diagnosis and treatment system with primary care as the first point of contact, enabling two-way referral and differentiated management of acute and chronic conditions. Hypertension diagnosis should occur at primary care institutions, with complex cases referred to large comprehensive hospitals through efficient two-way referral mechanisms. As hypertension cases become increasingly complex, large hospitals should assist primary care facilities in managing these patients through the rapidly developing medical consortium model and gradually established network management

systems, enabling initial diagnosis and management of common cases at the primary level while referring complex cases upward.

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