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Review Article

Management of Hypertension: A Bangladeshi Perspective

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Abstract

Hypertension is a silent killer. Bangladeshis are racially predisposed to cardiovascular disease, and the increasing burden of hypertension has only added to the problem. Economic constraints and the allure of additional benefits without adverse effects have made lifestyle modifications an attractive proposition in developing and developed countries alike. Blood pressure is a continuum and any increase above optimum level confers additional independent risk of cardiovascular disease. We review screening, diagnosis and management using lifestyle measures and pharmacotherapy. We then discuss the barriers and challenges to implementing this approach and what can be done regarding prevention, screening, lifestyle modification and pharmacotherapy in our country. By adopting a comprehensive population based approach including policy level interventions directed at promoting lifestyle changes; a healthy diet (appropriate calories, low in saturated fats and salt and rich in fruits and vegetables), increased physical activity, and a smoking free society, properly balanced with a high risk approach of cost effective clinical care, Bangladesh can effectively control hypertension and improve public health.

Introduction

Cardiovascular diseases (CVDs) are the leading cause of death and disability world wide and it accounted for about 30% of global mortality. About 80% of the deaths occur in developing countries.[1] Hypertension or high blood pressure is the most common risk factor for CVD morbidity and mortality.[1] More than a quarter of the world adult population, is currently hypertensive and this figure is projected to rise to 30%, by 2025. Hypertension is important not only for its high prevalence but also because it is a major modifiable risk factor for cardiovascular and kidney disease. It is a matter of great concern for us that almost three quarters of the global population with hypertension live in developing countries, which contributes to widening of existing global health disparities.[1,2] Furthermore, the onset of CVD is at an earlier age in developing countries and consequently the age at which people die of CVD is considerably younger than in developed countries, leading to widespread social and economic hardship.

Hypertension management therefore is of great public health importance in the developing world, which currently is facing the dual challenge of combating communicable diseases and the emerging epidemic of chronic non-communicable diseases. In this paper, we review screening, diagnosis and management using lifestyle measures and pharmacotherapy. We also will discuss the barriers and challenges to implement this approach and what can be done regarding the prevention of this deadly disease.

Diagnosis and screening

Proper diagnosis with accurate measuring devices is an important first step in the management of hypertension. Screening not only detects hypertension but also provides an opportunity for patient education and therapy.[3] In light of the growing epidemic of CVD in the developing world, WHO recommends that opportunistic screening of blood pressure is done at every visit to the physician's office.[4] The diagnosis of hypertension should not be made on one single measurement in a physician's office. If the blood pressure is elevated the individual must have the elevated blood pressure reconfirmed at subsequent visits within one month unless there is a hypertensive emergency or urgency.[5] Classification of hypertension according to the 7th Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7)[6] is given below, for all practical purpose it is easy and practical to follow.

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Table I

Classification of hypertension (JNC-7)

Category	Systolic BP mm Hg		Diastolic BP mm Hg
Normal	<120	&	<80
Pre hypertension	120-139	or	80-89
Stage1 hypertension	140-159	or	90-99
Stage 2 pertension	>=160	or	>= 100

Reproduced from the 7th Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7)6

Assessment of risk factors for cardiovascular diseases

Global risk assessment considering other concomitant cardiovascular risk factors should be included in the examination of every patient. Global risk assessment is an important tool to assist physicians and other health care providers to identify hypertensive individuals who are most likely to benefit from management including pharmacotherapy.[7] Well-established models are Framingham,[8] CV life expectancy[9] and SCORE.[10] Lipid lowering therapy and aspirin should be initiated in all patients at high cardiovascular risk.[7,11] A few investigations e.g. routine urine examination, serum creatinine level, chest radiograph and ECG should be done.

Lifestyle modifications

Lifestyle modification, is beneficial for both nonhypertensive and hypertensive individuals. For patients with hypertension and other cardiovascular risk factors such a hyperlipidemia, obesity and diabetes, lifestyle measures are even more important.[12]

" Maintaining a diet low in salt and saturated fats and high in fresh fruit and vegetables and low fat dairy products (DASH diet).

- 30-60 min of moderate intensity dynamic exercise (walking, as well as jogging, cycling or swimming) 4-7 days of the week will lower blood pressure.
- Weight reduction in overweight individuals.
- Smoking cessation to reduce global cardiovascular risk.
- Discouraging of alcohol consumption in those who drinks and also it is a social taboo in Bangladeshi society.

Thresholds for therapy

In patients without any additional cardiovascular risks, drug therapy should be initiated if the blood pressure is sustained above 160 mmHg systolic or 100 mmHg diastolic.[7] For patients with additional risk factors treatment can be initiated for sustained blood pressure greater than 140 mmHg systolic or for diastolic blood pressure greater than 90 mmHg. For patients with diabetes or renal disease, treatment should be initiated if the blood pressure is sustained greater than 130 mmHg systolic or 80 mmHg diastolic.

Target Blood pressure during pharmacotherapy

In most patients blood pressure should be lowered to less than 140 mmHg systolic and less than 90 mmHg diastolic.[7] For patients with renal disease or with diabetes, the blood pressure target is less than 130 mmHg systolic and less than 80 mmHg diastolic.

Initial pharmacotherapy for uncomplicated hypertension

The reduction in cardiovascular events in uncomplicated hypertension is dependant on the degree of blood pressure lowering and not on the specific blood pressure medication class used to lower blood pressure.[7,13-15] Initial therapy should be selected from classes of drugs proven to reduce cardiovascular events including low dose thiazide type diuretics, beta blockers in patients under age 60, angiotensin converting enzyme (ACE) inhibitors, long acting calcium channel blockers (CCBs) and angiotensin receptor blockers (ARBs). Beta blockers should not be selected as initial therapy in those over age 60 as they are less effective in the elderly.[7,16-18]

Specific pharmacotherapy for compelling indications

Table II outlines initial therapeutic options for patients with specific indications for pharmacotherapy.

Barriers and challenges in Bangladesh

Less than a third of hypertensive patients receive recommended levels of treatment even in rich and developed nations.[19] Low levels of awareness and inadequacy of treatment are of an even greater magnitude in the developing world particularly in Bangladesh.[20] This underscores the large gap between available evidence and clinical practice that could be improved to reduce the widespread health consequences of uncontrolled hypertension[21] particularly in the Bangladesh.

Economic burden

Multiplicity of health care providers including alternative care givers, lack of capacity and

affordability of physician services in our country adversely impacts hypertension care. Patients often pay out-of-pocket for their health care. Besides imposing considerable economic burden, this often drives many families into poverty particularly those with chronic conditions such as hypertension requiring life long care. Consequently, many stop treatment altogether or become non-adherent.

Suggestions for prevention of hypertension in the community

Developing countries cannot afford the resource intensive management of established hypertension and associated CVD that has been shown to be of limited success even in developed countries.[22] Substantially, greater gains in population health can be achieved by even a modest lowering of the population mean blood pressure. Such gains could be sustainable over time and can yield greater reductions in associated CVD events. Therefore, the major thrust of management of hypertension in such settings should be on primary prevention efforts through a comprehensive population based approach directed at lifestyle changes (a healthy appropriate calorie diet which is low in saturated fat and salt additives and

Table II

Therapeutic options for treating prypertension

Indications	Initial therapy	Second-line therapy	Notes
Isolated systolic hypertension without other compelling indications	Thiazide diuretics, ARBs, or long-acting dihydropyridine CCBs	Combinations of first-line drugs	Hypokalemia should be avoided in people who are prescribed diuretics
Diabetes mellitus with nephropathy	ACE inhibitors or ARBs	Addition of one or more of thiazide diuretics, cardio selective beta-blocker, long-acting CCBs or use of an ARB/ACE inhibitor combination	
Diabetes mellitus without nephropathy	ACE inhibitors, ARBs, or thiazide diuretics or long acting dihydropyridine CCBs	Combination of first line drugs or addition of cardio selective beta-blockers and/or long-acting CCBs	
Angina Pectoris	Beta-blockers (strongly consider adding ACE inhibitors)	Long-acting CCBs	Avoid short-acting nifedipine
Prior myocardial infarction	Beta-blockers and ACE inhibitors (ARBs if ACE intolerant)	Combinations of additional agents	
Heart Failure	ACE inhibitors (ARBs if ACE inhibitor intolerant), beta-blocker, spironolactone in selected patients	Hydralazine/ isosorbide dinitrate; thiazide or loop diuretics as additive therapy	Avoid nondihydropyridine CCBs
Past cerebrovascular accident or TIA	ACE inhibitor/diuretic combinations		Blood pressure reduction reduces recurrent cerebrovascular events
Chronic kidney disease	ACE inhibitors (diuretics as additive therapy)	Combinations of additional agents (ARBs if ACE inhibitor intolerant)	Avoid ACE inhibitors and ARBs if bilateral renal artery stenosis
Left ventricular hypertrophy	ACE inhibitors, ARBs, CCBs, thiazide diuretics (beta-blocker for patients under 60 years)		Avoid Hydralazine and minoxidil
Peripheral arterial disease	Does not affect treatment recommendations		Avoid beta-blockers with severe disease

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rich in fruits and vegetables, increased physical activity, and a smoking free society), properly balanced with a high risk approach of cost effective clinical care. The health care delivery system needs to emphasize early detection and treatment of individual patients at high risk with the most cost effective drugs. Existing networks of primary health care centers in developing nations should be optimally utilized and categories of healthcare providers, who can detect, educate and monitor hypertensive patients can be expanded to include nurses and multi purpose health workers. Though the current networks focus primarily on communicable diseases and reproductive health, networks could be used for opportunistic screening for hypertension and CVD risk assessment. A good model in optimal use of existing services for hypertension management was reported from South Africa, where a nurse led clinical protocol based in primary care clinics succeeded in achieving hypertension control in 68% of patients.[23]

Conclusion

Hypertension is a major cause of CVD morbidity and mortality in Bangladesh and presents an important opportunity to improve public health. Adequate scientific knowledge exists regarding prevention, treatment and management to reduce the disease burden associated with uncontrolled hypertension. Important initiatives that require consideration include organization of medical societies in SAARC nations to create region specific management recommendations, a sharing of knowledge, expertise and tools by developed nations and development of national policies and regulations to facilitate healthy environments.

References

1. Preventing chronic disease: a vital investment: WHO global report. World Health Organization, Geneva; 2005. Available at: http://www.who.int/chp/chronic_disease_report/en/ index. html
2. Kearney PM, Whelton M, Reynolds K, Muntner P, Whelton PK, He J. Global burden of hypertension: analysis of worldwide data. Lancet 2005;365:217-23.
3. Opie LH, Seedat YK. Hypertension in sub-Saharan African populations. Circulation 2005;112:3562-68.
4. Kadous H. Opportunistic screening for hypertension. Practitioner 1989;233: 225-26
5. Kaplan NM. Treatment of hypertension. Hypertension 2006; 47:10-13.
6. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure. JAMA 2003;289:2560- 72.
7. Khan NA, McAlister F, Lewanczuk R, et al for the Canadian Hypertension Education Program. The 2005 Canadian Hypertension Education Program (CHEP) recommendations for the management of hypertension: part 2 - therapy. Can J Cardiol 2005;21:657-72.
8. Lloyd-Jones DM, Wilson PW, Larson MG, et al Framingham risk score and prediction of lifetime risk for coronary heart disease. Am J Cardiol 2004;94:20-24.
9. Menotti A, Blackburn H, Kromhout D, Nissinen A, Adachi H, Lanti M. Cardiovascular risk factors as determinants of 25- year all-cause mortality in the seven countries study. Eur J Epidemiol 2001;17:337-46.
10. Neuhauser HK, Ellert U, Kurth BM. A comparison of Framingham and SCORE-based cardiovascular risk estimates in participants of the German National Health Interview and Examination Survey. Eur J Cardiovasc Prev Rehabil 1998;12:442-50.
11. Hansson L, Zanchetti A, Carson DS, et al Effects of intensive blood-pressure lowering and low-dose aspirin in patients with hypertension: principal results of the hypertension optimal treatment (HOT) randomized trial. Lancet 1998;351: 1755-62.
12. Touyz RM, Campbell N, Logan A, Gledhill N, Pedrella R, Padwal R. The 2004 Canadian recommendation for the management of hypertension: part III -lifestyle modification to prevent and control hypertension. Can J Cardiol 2004;20:55-59.
13. Neal B, MacMahon S, Chapman N, Blood Pressure Lowering Treatment Trialists' Collaboration. Effects of ACE inhibitors, calcium antagonists, and other blood pressure lowering drugs: results of prospectively designed overviews of randomized trials. Lancet 2000;356:1955-64.
14. Turnbull FBlood Pressure Lowering Treatment Trialists' Collaboration. Effects of different blood-pressure-lowering regimens on major cardiovascular events: results of prospectively- designed overviews of randomized trials. Lancet 2003; 362:1527-35.
15. Staessen JA, Wang JG, Birkenha¨ger WH. Outcome beyond blood pressure control? Eur Heart J 2003;24:504-14.
16. Medical Research Council Working Party. Medical Research Council trial of treatment of hypertension in older adults: principal results. BMJ 1992;304:405-12.
17. Lindholm L, Ibsen H, Dahlof B, et al. Cardiovascular morbidity and mortality in patients with diabetes in the Losartan intervention for endpoint reduction in hypertension study (LIFE): a randomized trial against atenolol. Lancet 2002; 359:1004-10.
18. Messerli FH, Grossman E, Goldbourt U. Are b-blockers efficacious as first-line therapy for hypertension in the elderly? A systematic review. JAMA 1998; 279:1903-07.
19. Kaplan NM, Opie LH. Controversies in hypertension. Lancet 2006;367:168-76.
20. Quasem I, Shetye MS, Alex SC, et al. Hypertension Study Group Prevalence, awareness, treatment and control of hypertension among the elderly in Bangladesh and India: a multicentre study. Bull World Health Organ 2001; 79:490-500.
21. World Health Organization. The World Health Report 2002. Reducing risks and promoting healthy life. Geneva (Switzerland): World Health Organization; 2002.
22. Reddy KS. Cardiovascular diseases in non-western countries. New Engl J Med 2004;350:2438-40.
23. Coleman R, Gill G, Wilkinson D. Noncommunicable disease management in resource-poor settings: a primary care model from rural South Africa. Bull World Health Organ 1998;76:633-40.