



Prescribing Trends of Antihypertensive Drugs At Government Hospitals and Private Clinics In Bangladesh

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ABSTRACT

Hypertension (HTN) is the most common chronic condition dealt with primary care physicians and other health practitioners and is arguably the most important modifiable risk factor for coronary heart disease and stroke. The aim of our current study was designed to evaluate the prevalence of hypertension on age it is more prone to be started now a day, alongside the spectrum of HTN in respect with gender categorization. This study was carried out in the cardiology clinics as well as government hospitals and others at four cities in Bangladesh. From this survey the outcome was found that 39% of 45-60 years and 27% of 35-45 years aged was hypertensive patient, of which 54.83% were male and 45.17% were female. However, HTN control rates of patients cared for longitudinally by cardiologist, it was observed that beta blocker was present in 45% mono therapy prescriptions, among which only propranolol was for 34% cases and losartan was 20% at second. Combination therapy was also found to prescribe where olmesartan plus atenolol was 19% and amlodipine plus atenolol was prescribed for 17% of hypertensive patients.

Keywords: Hypertension, Cardiology, Prescription, Physician.

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INTRODUCTION

Hypertension, defined as a persistent raised blood pressure of 140/90mmHg, is one of the most common disorders in the world that rarely causes symptoms on its own, the damage it does to the arteries and organs can lead to considerable suffering and burdensome healthcare costs. About one third of adults in most communities in the developed and developing world have hypertension. Most major guidelines recommend that hypertension be diagnosed when a person's systolic blood pressure is ≥ 140 mm Hg or their diastolic blood pressure is ≥ 90 mmHg, or both, on repeated examination^{1,2}. Previously, an increase of 15 mm Hg diastolic and 30 mm Hg systolic, respectively, even if the final value $>140 / 90$ mm Hg was also included in the definition^{3, 4}. However, data demonstrating that outcomes are similar irrespective of the magnitude of rise when values remain $<140 / 90$ mm Hg, have led consensus groups to delete this latter definition. Hypertension is a risk factor for heart disease, kidney disease and stroke. Patients achieving target blood pressure can prevent many of these devastating and costly diseases. It has been shown through the proper use of medication these complications can be prevented⁵. Using reliable at home health information can assist patients achieve long term management of their chronic conditions. About 69% of people who have a first heart attack, 77% who have a first stroke, and 74% with heart failure have blood pressure higher than 140/90 mmHg⁶. Among those individuals with hypertension age 18 and older, 71.8% are aware of their condition, and 61.4% are currently undergoing treatment. However, just 35.1% have their blood pressure (BP) under control while 64.9% do not. If blood pressure control could be improved, cardiovascular morbidity and mortality would decrease significantly⁷. Considerable hurdles remain in overcoming the burden of hypertension. First, the insidious nature in which hypertension develops means that hypertension is frequently undiagnosed, and early detection prior to the development of end-organ damage remains a challenge. Second, many patients appropriately diagnosed with hypertension fail to achieve the treatment targets recommended by guidelines. This highlights the considerable challenges in implementing risk factor modification and appropriate adherence to antihypertensive therapies long term. Third, uncertainty remains as to the appropriate BP treatment target for high-risk patients. While a target BP $<140/90$ mm Hg is generally recommended, a lower threshold of $<130/80$ mm Hg is recommended for patients at high risk of cardiovascular disease, such as patients with diabetes^{8,9}. Fourth, even among patients who receive appropriate care, a proportion of patients remain resistant to treatment despite multiple medications. These patients with resistant hypertension carry substantial risk of adverse

events¹⁰. The emergence of renal artery de-innervation may herald a novel and effective procedural option to treat this patients¹¹. It is very necessary to recognize effects of different classes of antihypertensive drugs in reducing the incidence of cardiovascular disease outcomes for healthy people at risk of these diseases.

MATERIALS AND METHOD

Study design and study population

The study was a cross-sectional survey of all prescriptions received from the patients over four month's period from October 2015 to January 2016 at Dhaka, Khulna, Satkhira, and Jessore cities in Bangladesh. Prescriptions were collected from patient, identified the antihypertensive drug & then capture a picture of the prescription. The layout of the prescriptions was assessed on the basis of the presence or otherwise of the following details: information about prescribe person's (doctor's name, address, phone number, qualifications and signature). The content of prescriptions was assessed on the basis of drug used (anti-hypertensive drug, whether generic names or brand names were used).

Survey area:

Dhaka city, Khulna city, Satkhira, and Jessore districts were selected for survey purpose.

Study selection

We first assessed the prescriptions and find out the name and age of patient the drugs. Secondly, we have collected brand name of prescribed drug and in turn find out generic of each. Finally potentially relevant reports were assessed. Each step is made by independent assessments.

Data collection process

A total of 355 prescriptions were carefully monitored. The data collectors were waiting in front of government medical college hospitals, private clinics & chambers for collecting prescriptions. Data extraction was done independently by our team using a simple, standardized form.

Data items

We extracted, where possible, data for the following main outcomes from all the included studies: total sufferer, myocardial infarction and stroke. In addition, we extracted data on the following outcomes: angina, heart failure and diabetes.

Statistical analysis

Descriptive statistics were applied to the collected data using Microsoft Excel software. Simple statistical method (Bar diagram) was used to calculate the data and finally expressed in percentages

Ranking of drug-classes

The findings from our ranking of drug-classes are ambiguous in the sense that certain drug-classes were superior for some outcomes, while other drugs fared better for other outcomes shown below (Table-1).

Table 1: Proportion of times that a drug-class ended up among the top three. (In repeated simulations)^{12, 13}

	Mortality	Myocardial infarction	Stroke	Angina	Heart failure	Diabetes
Diuretics	18%	79%	46%	33%	99%	1%
BB	1%	2%	3%	38%	10%	9%
ACE	23%	75%	11%	27%	83%	96%
CCB	54%	36%	98%	51%	1%	62%
Alpha-blocker	25%	58%	9%	45%	0%	-
ARB	49%	5%	60%	22%	22%	99%
Diuretics and/or BB	84%	45%	71%	22%	65%	33%
"Conventional"	46%	0%	1%	-	20%	-

ACE= Angiotensin Converting Enzyme Inhibitors; ARB= Angiotensin Receptor Blockers; BB= Beta-blockers; CCB= Calcium Channel Blockers.

RESULTS AND DISCUSSION

In the case of hypertensive patients, beta blockers (propranolol) were most commonly prescribed drug. Then calcium channel blocker (amlodipine) & Angiotensin1 (AT1) antagonist (losartan or olmesartan) were used. 68.42% patients were prescribed for mono therapy and 31.5% were treated as severe patient in combination medication. Amlodipine-atenolol was the leading combination used by hypertensive patients. On the other hand, hypertensive diabetic patient used beta-blocker (metoprolol) most commonly prescribed in monotherapy. The use of beta blocker is followed by amlodipine and olmesartan respectively. In combination therapy, a two-drug combination consisting of calcium channel blockers (amlodipine) and beta blocker (atenolol) were given to the majority of patients followed by a combination of calcium channel blockers (amlodipine) and AT1 antagonist (olmesartan). Some patients also prescribed for combination of diuretics (hydrochlorothiazide) with AT1 antagonists (losartan).

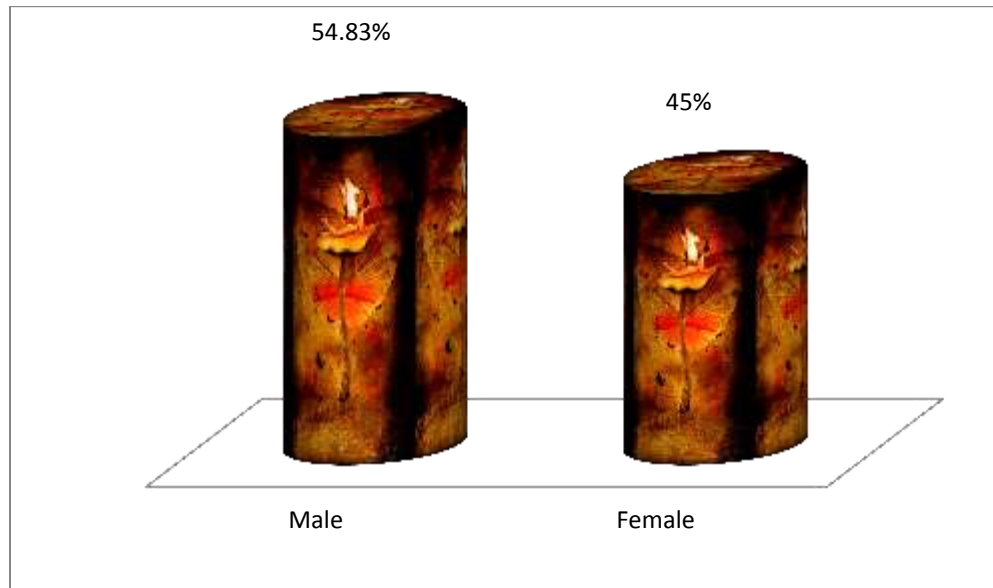


Figure 1: Percentage of prescribed drug in gender categorization.

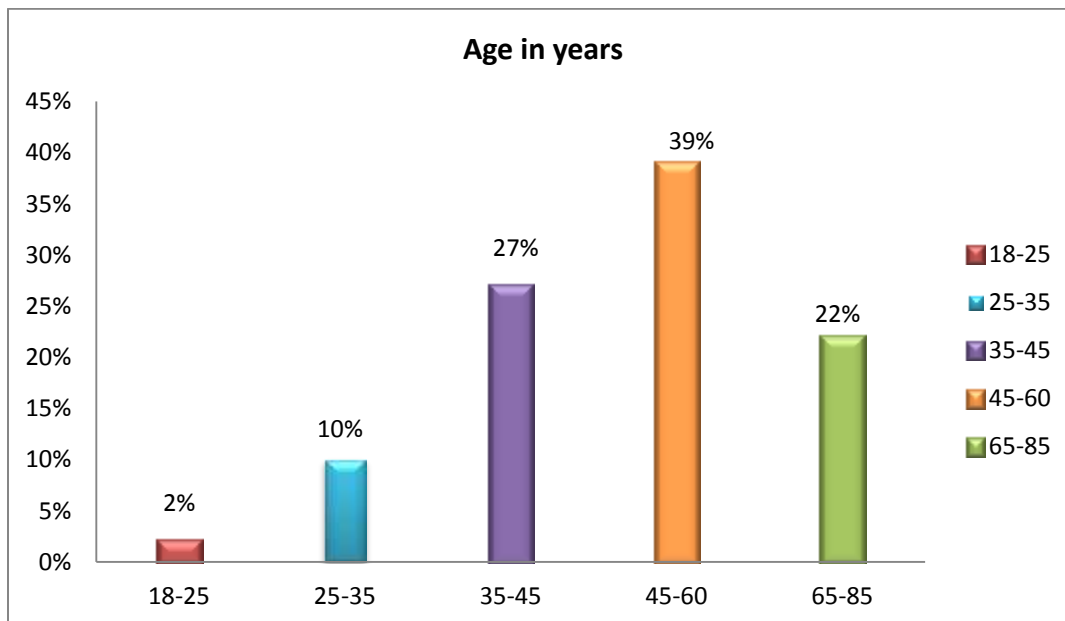


Figure 2: Age related variation of used drugs from collected prescription.

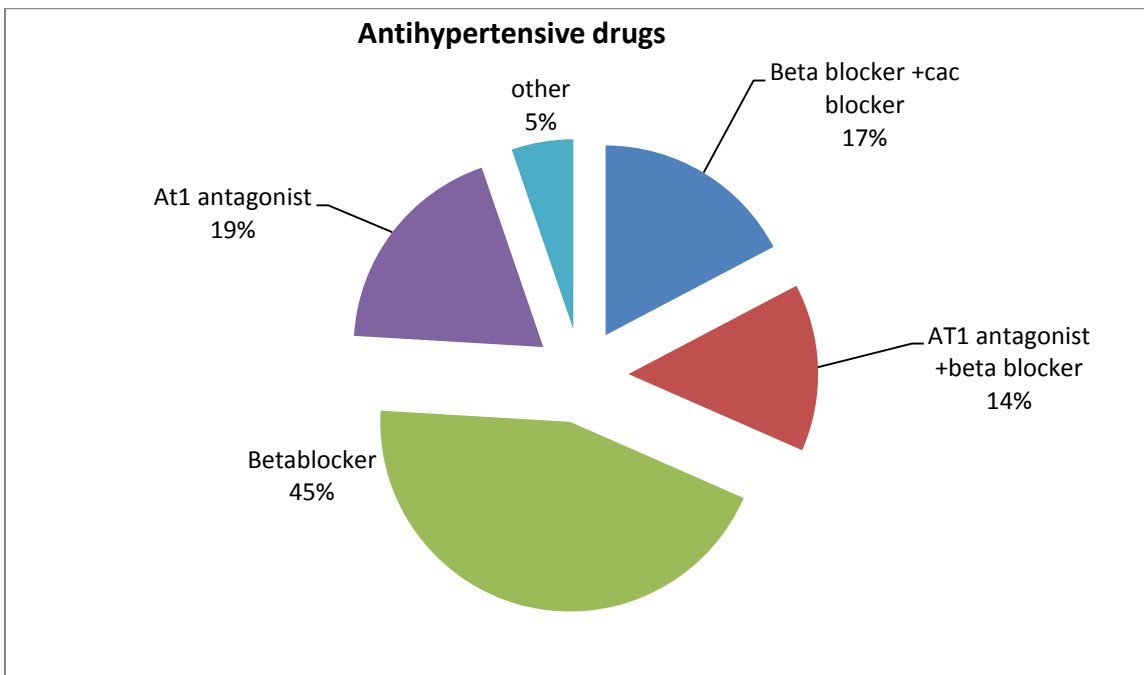


Figure 3: Selected responses from prescriptions (on the basis of each group).

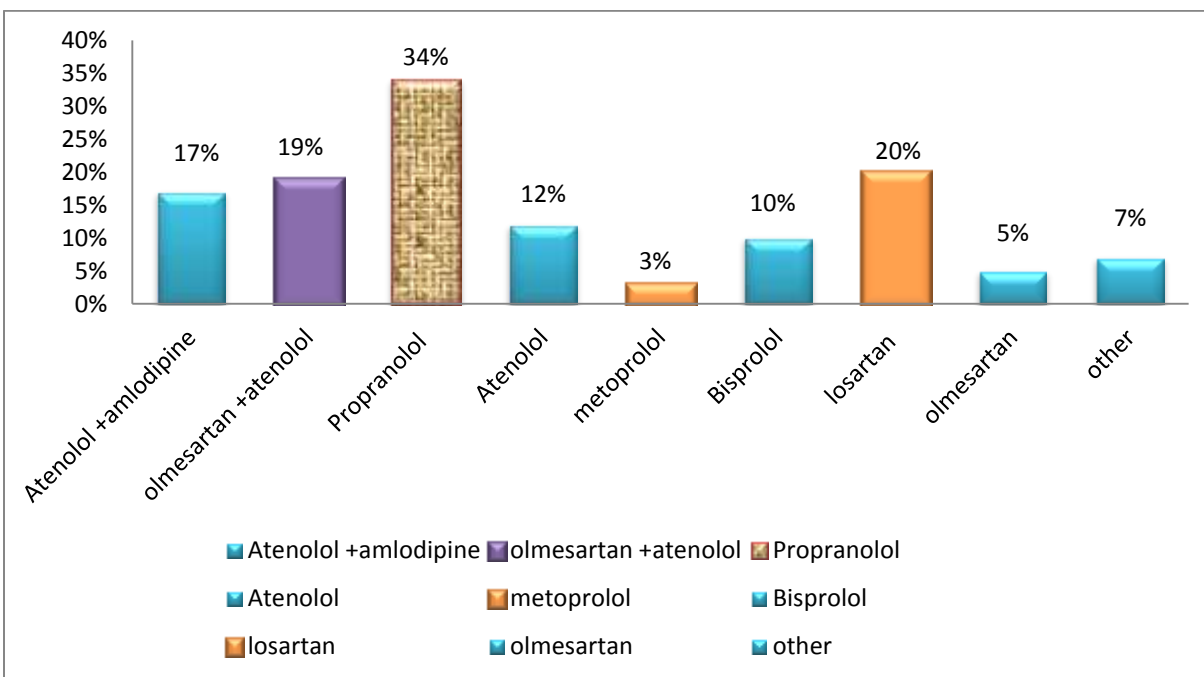


Figure 4: Percentage use of various generic collected from patient's prescriptions.

CONCLUSION

The findings of this study suggest the presence of a dose-response effect for the length of time at high BP levels and risk of adverse cardiac events. These study findings re-iterates the importance of maintaining a blood pressure within normal limits for prevention of hypertension which minimizes the risk of cardiovascular disease. The challenges of managing hypertension and

preventing the development of these latter outcomes are unlikely to relent; the global burden of hypertension is projected to increase by 60% to affect approximately 1.6 billion adults worldwide by 2025.¹⁴ The challenges highlighted are pertinent to many populations. Many low- and middle-income countries, most of which are in the midst of the epidemiological transition, face rapidly increasing prevalence of hypertension in the context of limited healthcare resources. In these countries, diagnosis and appropriate management of hypertension remains disconcertingly low¹⁵. Developing innovative and cost-effective solutions to improve hypertension diagnosis and control thus remains a key priority. These issues are not limited to developing countries alone; less than 35% of the patients have appropriate BP control despite good access to care, a wealth of evidence surrounding lifestyle modification, and the presence of highly efficacious anti-hypertensive therapies^{16, 17}. Combination therapy may be the rational approach to reducing the hypertension. At the advent of the new millennium, we are really unaware of our real situation, whereas HTN is getting epidemic proportion worldwide. Large-scale, preferably, nation-wide survey, and clinical research should be conducted to determine the different aspects of HTN in Bangladesh. We have no more time to lapse and the information available thereby, would help to formulate national policy to combat the deadly epidemic more efficiently in future.

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REFERENCES

1. Flack JM, Sica DA, Bakris G, et al. Management of high blood pressure in Blacks: an update of the International Society on Hypertension in Blacks consensus statement. *Hypertension* 2010; 56: 780–800.
2. National Institute for Health Care Evidence. CG127. Hypertension: Clinical management of primary hypertension in adults. On-line: NICE Clinical Guidelines. February 2011.
3. Mancia G, Fagard R, Narkiewicz K, et al. 2013 ESH/ESC Guidelines for the management of arterial hypertension. *J Hypertens* 2013; 31: 1281–357.
4. Beckett NS, Peters R, Fletcher AE, et al. Treatment of hypertension in patients 80 years of age or older. *N Engl J Med* 2008; 358: 1887–98.
5. F.H.H. Leenan et. al. Results of the Ontario Survey on the Prevalence and Control of Hypertension. *Canadian Medical Association Journal* May 2008; 178 (11).

6. American Heart Association. Heart Disease and Stroke Statistics — 2008 Update. Dallas, Texas. American Heart Association 2008.
7. B.B. Green et al. Electronic Communications and Home Blood Pressure Monitoring (e-BP) study. Design, delivery, and evaluation framework, Contemporary Clinical Trials 29 2008; 376–395.
8. Chobanian AV, Bakris GL, Black HR, Cushman WC, Green LA, Izzo JL Jr., Jones DW, Materson BJ, Oparil S, Wright JT Jr., Roccella EJ. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. National Heart, Lung, and Blood Institute Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure; National High Blood Pressure Education Program Coordinating Committee.: the JNC 7 report. JAMA 2003; 289: 2560–2572.
9. Bangalore S, Kumar S, Lobach I, Messerli FH. Blood pressure targets in subjects with type 2 diabetes mellitus/impaired fasting glucose: observations from traditional and bayesian random-effects meta-analyses of randomized trials. Circulation 2011; 123: 2799–2810.
10. Daugherty SL, Powers JD, Magid DJ, Tavel HM, Masoudi FA, Margolis KL, O'Connor PJ, Selby JV, Ho PM. Incidence and prognosis of resistant hypertension in hypertensive patients. Circulation 2012; 125: 1635–1642.
11. Esler MD, Krum H, Sobotka PA, Schlaich MP, Schmieder RE, Bohm. Renal sympathetic denervation in patients with treatment-resistant hypertension (the Symplicity HTN-2 trial): a randomized controlled trial. Lancet. 2010; 376: 1903–1909.
12. The World Health Organization: The World Health Report 2002 Reducing Risks, Promoting Healthy Lives. 2002, Geneva: The World Health Organization.
13. Collins R, Peto R, MacMahon S, Hebert P, Fiebach NH, Eberlein KA, Godwin J, Qizilbash N, Taylor JO, Hennekens. CH: Blood pressure, stroke, and coronary heart disease. Part 2, Short-term reductions in blood pressure. Overview of randomized drug trials in their epidemiological context. Lancet 1990; 335: 827-838.
14. Kearney PM, Whelton M, Reynolds K, Muntner P, Whelton PK, He. Global burden of hypertension: analysis of worldwide data. Lancet 2005; 365: 217–223.
15. Xu B, Xu Z, Xu X, Cai Q, Xu Y. Prevalence, awareness, treatment, and control of hypertension among residents in Guangdong Province, China, 2004 to 2007. Circ Cardiovasc Qual Outcomes 2013; 6: 217–222.

16. Jafar TH, Islam M, Bux R, Poulter N, Hatcher J, Chaturvedi N, Ebrahim S, Cosgrove P; Hypertension Research Group. Cost-effectiveness of community-based strategies for blood pressure control in a low-income developing country: findings from a cluster-randomized, factorial-controlled trial. *Circulation* 2011; 124: 1615–1625.
17. Gu Q, Burt VL, Dillon CF, Yoon S. Trends in antihypertensive medication use and blood pressure control among United States adults with hypertension: the National Health And Nutrition Examination Survey, 2001 to 2010. *Circulation* 2012; 126: 2105–2114.



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