

Hypertension Control in Patients Attending Outpatient Department: A Hospital Based Study from Lumbini Province Nepal

Samir Gautam,¹ Sachin Dhungel,^{1*} Bishal KC,¹ Mazhar Khan,¹ Abhishesh Shakya,¹ Rajesh Panjiyar¹

¹Gautam Buddha Community Heart Hospital, Butwal, Nepal

Received: 8th March, 2023

Accepted: 18th May, 2023

Published: 30th June, 2023

DOI: 10.3126/jnhls.v2i1.56157

Correspondence:

*Dr. Samir Gautam, Gautam Buddha Community Heart Hospital, Butwal, Nepal.

Email: samirgautam22@gmail.com

Phone: +977-9852047041

Citation: Gautam S, Dhungel S, KC B, Khanal M, Shakya A, Panjiyar R. Hypertension Control in Patients Attending Outpatient Department: A Hospital Based Study from Lumbini Province Nepal, JNHLS. 2023; 2(1):14-18.

ABSTRACT

Background: Systemic hypertension is major public health problem. It is easy to diagnose and initiate treatment. But still it remains under detected, undertreated and less well controlled throughout the world. We wanted to know control of hypertension in patients attending outpatient department in a cardiac center.

Methods: This is a cross-sectional observational study conducted at Gautam Buddha Community Heart Hospital. One hundred newly detected hypertensive patients attending outpatient department were evaluated in this study.

Results: Distribution of patients was males 56% and females 44%. Most patients (55%) were in the age group 45 to 65 years. Headache (42%) and dizziness (39%) were common symptoms at presentation. Majority of hypertensive patients had blood pressure range 140 to 160 SBP (49%) and 90 to 100 DBP (56%). Hypertension control target reached in 69% for SBP and 90% for DBP at one month. Target blood pressure was present in 82% for SBP and 84% for DBP at three months follow up.

Conclusion: Hypertension management in short term appears promising but long term control is more important to prevent complications. So long term follow up study or national registry database is important.

Keywords: hypertension; outpatient; lumbini province; Nepal.

INTRODUCTION

Based on office BP, the global prevalence of hypertension was estimated to be 1.13 billion in 2015.¹ The overall prevalence of hypertension in adults is around 30 - 45%. This high prevalence of hypertension is consistent across the world, irrespective of income status, i.e. in lower, middle, and higher income countries.² Despite advances in diagnosis and treatment over the past 30 years, the disability-adjusted life years attributable to hypertension have increased by 40% since 1990.³ Both office BP and out-of-office BP have an independent and continuous relationship with the incidence of several CV events [hemorrhagic stroke, ischemic stroke, myocardial infarction, sudden death, heart failure, and peripheral artery disease (PAD)], as well as end-stage renal disease.⁴ The continuous relationship between BP and risk of events has been shown at all ages⁵ and in all ethnic group.^{6,7} Hypertension Mediated Organ Damage (HMOD) refers to structural or functional changes in arteries or end organs (heart, blood vessels, brain, eyes, and kidney) caused by an elevated BP, and is a marker of pre-clinical or asymptomatic CVD.⁸ HMOD is common in severe or long-standing hypertension, but can also be found in less severe hypertension. With wider use of imaging, HMOD is becoming increasingly apparent in asymptomatic patients.⁹ CV risk

increases with the presence of HMOD, and more so when damage affects multiple organs.¹⁰⁻¹² Some types of HMOD can be reversed by antihypertensive treatment, especially when used early, but with long-standing hypertension, HMOD may become irreversible despite improved BP control.^{13,14} Healthy lifestyle choices can prevent or delay the onset of hypertension and can reduce CV risk. The recommended lifestyle measures that have been shown to reduce BP are salt restriction, moderation of alcohol consumption, high consumption of vegetables and fruits, weight reduction and maintaining an ideal body weight, and regular physical activity.^{15,16} A major drawback of lifestyle modification is the poor persistence over time.^{17,18} Irrespective of the world region, whether high- or low-income economies, or the level of sophistication of healthcare provision, only 40% of patients with hypertension are treated; of these, only 35% are controlled to a BP of less than 140/90 mmHg.¹⁹ In Nepal even in well-educated professional group awareness of hypertension was found to be low 30%. Despite known to be hypertensive 36% were not on medications. Among persons on antihypertensive medicines 55% had target blood pressure control.²⁰ We wanted to know about initial control of hypertension in patients presenting to hospital outpatient department with high blood

pressure on short term with follow up evaluation at one month and three month.

METHODS

This study was conducted at Gautam Buddha Community Heart Hospital, Rupandehi, Nepal from January 2022 to September 2022. Patients presenting at outpatient department with first time diagnosis of hypertension giving consent for the study were evaluated. Those patients who were previously diagnosed as hypertension were excluded. First 100 patients giving consent were included in the study for evaluation. Demographic data and blood pressure measurement were recorded. Both arm blood pressure measurement taken after 10 minutes rest in outpatient clinic in sitting position. Average of more than one blood pressure measurements taken as recorded blood pressure. European Society of Hypertension (ESH) and European Society of Cardiology (ESC) clinical practice guideline 2018 used to define hypertension. Evaluated with renal function test, lipid profile, uric acid, hemoglobin level, random blood sugar, electrocardiography, echocardiography and ultrasonography of abdomen. Findings on investigations recorded in proforma. Patients well counselled to come on follow up. Follow up blood pressure measurement done at 1 month and 3 months. Study completed with completion of 3 months follow up. Observed findings tabulated and percentage calculation done. SPSS 22 software used for calculation and analysis of data.

RESULTS

Out of total 100 patients 56% were male and 44% female. Most patients were of age group 45 to 65 years (Table 1).

Age years	Frequency (%)
Less than 45	35(35)
45 to 65	55(55)
More than 65	10(10)

Headache and Dizziness were common symptoms (Table 2) at presentation and other uncommon symptoms noted were tremor, restlessness, sweating and abdominal fullness.

Symptoms	Frequency (%)
Headache	42(42)
Dizziness	39(39)
Chest Discomfort	18(18)
Palpitation	15(15)
Dyspnea	13(13)
Tingling extremities	4(4)

Grade 1 hypertension was noted in majority of patients (Table 3).

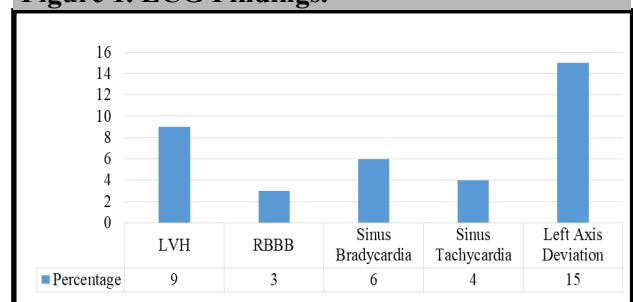
SBP	Frequency(%)	DBP	Frequency (%)
140-160	49(49)	90-100	56(56)
160-180	35(35)	100-110	29(29)
> 180	16(16)	> 110	15(15)

Diastolic blood pressure control was more frequent in 1 month follow up and systolic blood pressure control was incremental in 3 month follow up (Table 4).

1 month	Frequency (%)	3 month	Frequency (%)
SBP<140	69(69)	SBP< 140	82(82)
DBP <90	90(90)	DBP <90	84(84)

Concomitant risk factor and lifestyle evaluation showed nonsmoking tobacco use in 27%, alcohol use in 18% and smoking in 15%. Electrocardiographic finding of left axis deviation was most frequent 15% followed by LVH 9% (Figure 1).

Figure 1. ECG Findings.



Diastolic dysfunction was most common finding on echocardiography 51% and left ventricular hypertrophy noted in 24%. Other echocardiographic findings included mitral regurgitation (15%), aortic regurgitation (7%) and one patient had severe mitral regurgitation.

Dyslipidemia was found in 44% patients. Dyslipidemia included reduced HDL (36%), increased LDL (30%), increased triglyceride (27%), increased VLDL (15%) and increased total cholesterol (13%). Hyperuricemia noted in 39% patients. Other associated conditions were obesity (26%), anemia (8%), thyroid disorder (6%) and concomitant diagnosis of diabetes mellitus in 4%. Raised creatinine level found in 16% and albuminuria in 9%. Fatty change in liver was noted in 45% patients. Combination drugs were used as initial therapy in 72% patients. ACE-I or ARB group were the most commonly used 64%. Use of CCB was 60%, Beta blocker 50% and Diuretic 32%.

DISCUSSION

This study showed male preponderance of initial presentation. Presentation at middle age (45 to 65 years) was more common. This might represent delay in presentation to hospital and less frequent general evaluation in asymptomatic persons and ignorance of minor symptoms. The first presentation with high blood pressure in age group after 65 years was 10%. It is known that with advancement of age likelihood of hypertension increases. But to prevent end organ complications routine evaluation of seemingly healthy people is important. This might help to reduce hypertension mediated organ damage. This gives an opportunity to advise persons to lifestyle changes so that hypertension and even other risk factors for ASCVD can be modified. In this study naïve hypertensive patients were taken as subjects and evaluated. Echocardiographic left ventricular hypertrophy was found in 24% and diastolic dysfunction in 51%. This shows hypertension was present in these patients for long duration causing changes in cardiac structure or function. Studies indicate ECG LVH provides independent prognostic information, even after adjusting for other CV risk factors and echocardiographic LV mass.²¹ In addition to LVH, the presence of a 'strain pattern' on an ECG is associated with increased risk.²² The prevalence of ECG LVH increases with the severity of hypertension.²³ Echocardiographic LVH is a potent predictor of mortality in both hypertensive patients and the general population,^{24, 25} and regression of echocardiographic LVH due to treatment of hypertension predicts an improved prognosis.²⁶ We found control of hypertension to target level in more than two third at one month and more than 80% at 3 months. This is good control seen if we compare community prevalence of hypertension control. In Nepal study by Karmacharya et. al., found control of hypertension in 35% and Devkota S et. al., 49%.^{27, 28} But it is important to maintain the same level or improved control of blood pressure over long duration of time. Constant follow up with good adherence is needed. This data might not represent people from remote areas having no or limited access to health care system facilities and very poor economic con-

ditions limiting evaluation and follow up as per need.

In this study dyslipidemia noted in 44% naïve hypertensive patients, obesity in 26%, diabetes mellitus in 4%. Hyperuricemia noted in 39%. Raised creatinine in 16% and albuminuria in 9%. Pathak SR et al found microalbuminuria in 37% cases and LVH in 42% cases in outpatient evaluation of hypertensive patients.²⁹ Mehata RK et. al., found hyperuricemia in 25% hypertensive patients in hospital based study in eastern Nepal.³⁰ In this study initiation of antihypertensive medication as a two drug combination was found in 72% patients. Initial combination therapy is invariably more effective at BP lowering than monotherapy, indeed even low-dose combination therapy is usually more effective than maximal dose monotherapy. Two-drug combinations as initial therapy have been shown to be safe and well tolerated, with no or only a small increase in the risk of hypotensive episodes.³¹

CONCLUSION

In this hospital based short term follow up outpatient study showed good control of hypertension at one month and three month. Long term data is needed to see the proper control of hypertension over time. Large data will be more representative of population. So large study with long term follow up study is recommended to know the better representative status of hypertension control in Nepalese population.

Limitation

This study was conducted in a cardiac hospital outpatient setting. This might not represent population with limited access to health care system facilities and hypertension control in remote areas of Nepal. Follow up duration of three month is not enough to predict long-term compliance and control of hypertension.

Conflict of Interest: None.

REFERENCES

1. NCD Risk Factor Collaboration. Worldwide trends in blood pressure from 1975 to 2015: a pooled analysis of 1479 population-based measurement studies with 19.1 million participants. *Lancet* 2017; 389:37–55.
2. Chow CK, Teo KK, Rangarajan S, Islam S, Gupta R, Avezum et al, PURE Study Investigators. Prevalence, awareness, treatment, and control of hypertension in rural and urban communities in high-, middle-, and low-income countries. *JAMA* 2013; 310:959–968.
3. Forouzanfar MH, Liu P, Roth GA, Ng M, Biryukov S, Marczak L et al, Global burden of hypertension and systolic blood pressure of at least 110 to 115 mm Hg, 1990-2015. *JAMA* 2017; 317: 165–182.
4. Lewington S, Clarke R, Qizilbash N, Peto R, Collins R. Age-specific relevance of usual blood pressure to vascular mortality: a meta-analysis of individual data for one million adults in 61 prospective studies.

- Lancet 2002; 360:1903–1913.
5. Vishram JK, Borglykke A, Andreassen AH, Jeppesen J, Ibsen H, Jorgensen Tet al. MORGAM Project. Impact of age on the importance of systolic and diastolic blood pressures for stroke risk: the MONica, Risk, Genetics, Archiving, and Monograph (MORGAM) project. *Hypertension* 2012; 60:1117–1123.
 6. Brown DW, Giles WH, Greenlund KJ. Blood pressure parameters and risk of fatal stroke, NHANES II mortality study. *Am J Hypertens* 2007; 20:338–341.
 7. Lawes CM, Rodgers A, Bennett DA, Parag V, Suh I, Ueshima H, MacMahon . Asia Pacific Cohort Studies Collaboration. Blood pressure and cardiovascular disease in the Asia Pacific region. *J Hypertens* 2003; 2.
 8. Devereux RB, Alderman MH. Role of preclinical cardiovascular disease in the evolution from risk factor exposure to development of morbid events. *Circulation* 1993; 88:1444–1455.
 9. Perrone-Filardi P, Coca A, Galderisi M, Paolillo S, Alpendurada F, de Simone G et al. Noninvasive cardiovascular imaging for evaluating subclinical target organ damage in hypertensive patients: a consensus article from the European Association of Cardiovascular Imaging, the European Society of Cardiology Council on Hypertension and the European Society of Hypertension. *J Hypertens* 2017; 35:1727–1741.
 10. Mancia G, De Backer G, Dominiczak A, Cifkova R, Fagard R, Germano G et al. 2007 Guidelines for the management of arterial hypertension: the Task Force for the Management of Arterial Hypertension of the European Society of Hypertension (ESH) and of the European Society of Cardiology (ESC). *J Hypertens* 2007; 25:1105–1187.
 11. Cordero A, Morillas P, Bertomeu-Gonzalez V, Quiles J, Mazon P, Guindo J et al. Prevalence of Peripheral Arterial Disease in Patients with Acute Coronary Syndrome Investigators. Clustering of target organ damage increases mortality after acute coronary syndromes in patients with arterial hypertension. *J Hum Hypertens* 2011; 25:600–607.
 12. Greve SV, Blicher MK, Sehestedt T, Gram-Kampmann EM, Rasmussen S, Vishram JK, Olsen MH. Effective risk stratification in patients with moderate cardiovascular risk using albuminuria and atherosclerotic plaques in the carotid arteries. *J Hypertens* 2015; 33:1563–1570.
 13. De Simone G, Devereux RB, Izzo R, Girfoglio D, Lee ET, Howard BV, Roman MJ. Lack of reduction of left ventricular mass in treated hypertension: the strong heart study. *J Am Heart Assoc* 2013; 2:e000144.
 14. Lonnebakk MT, Izzo R, Mancusi C, Gerdt E, Losi MA, Cancelli G, Giugliano G, De Luca N, Trimarco B, de Simone G. Left ventricular hypertrophy regression during antihypertensive treatment in an outpatient clinic (the Campania Salute Network). *J Am Heart Assoc* 2017; 6:e004152.
 15. Mancia G, Fagard R, Narkiewicz K, Redon J, Zanchetti A, Bohm M et al. 2013 ESH/ESC guidelines for the management of arterial hypertension: the Task Force for the Management of Arterial Hypertension of the European Society of Hypertension (ESH) and of the European Society of Cardiology (ESC). *Eur Heart J* 2013; 34:2159–2219.
 16. Piepoli MF, Hoes AW, Agewall S, Albus C, Brotons C, Catapano AL et al. ESC Scientific Document Group. 2016 European Guidelines on cardiovascular disease prevention in clinical practice: The Sixth Joint Task Force of the European Society of Cardiology and Other Societies on Cardiovascular Disease Prevention in Clinical Practice (constituted by representatives of 10 societies and by invited experts) Developed with the special contribution of the European Association for Cardiovascular Prevention & Rehabilitation (EACPR). *Eur Heart J* 2016; 37:2315–2381.
 17. Stevens VJ, Obarzanek E, Cook NR, Lee IM, Appel LJ, Smith West Detal. Trials for the Hypertension Prevention Research G. Longterm weight loss and changes in blood pressure: results of the Trials of Hypertension Prevention, phase II. *Ann Intern Med* 2001; 134:1–11.
 18. Whelton PK, Appel LJ, Espeland MA, Applegate WB, Ettinger WH Jr, Kostis JB, Kumanyika S, Lacy CR, Johnson KC, Folmar S, Cutler JA. Sodium reduction and weight loss in the treatment of hypertension in older persons: a randomized controlled trial of nonpharmacologic interventions in the elderly (TONE). TONE Collaborative Research Group. *JAMA* 1998; 279:839–846.
 19. Chow CK, Teo KK, Rangarajan S, Islam S, Gupta R, Avezum A, Yusuf S at al PURE Study Investigators. Prevalence, awareness, treatment, and control of hypertension in rural and urban communities in high-, middle-, and low-income countries. *JAMA* 2013; 310:959–968.
 20. Mani Prasad Gautam, Usha Ghimire, Krishna Maya Shrestha, et al. Prevalence, awareness and control of hypertension in a well-educated professional group in Nepal. *Nepalese Heart Journal* 2017; 14(1): 21–24.
 21. Bacharova L, Schocken D, Estes EH, Strauss D. The role of ECG in the diagnosis of left ventricular hypertrophy. *CurrCardiol Rev* 2014; 10:257–261.
 22. Pahor M, Guralnik JM, Ambrosius WT, Blair S, Bonds DE, Church TS et al. Effect of structured physical activity on prevention of major mobility disability in older adults: the LIFE study randomized clinical trial. *JAMA* 2014; 311:2387–2396.
 23. Lehtonen AO, Puukka P, Varis J, Porthan K, Tikkanen JT, Nieminen M Set al. Prevalence and prognosis of ECG abnormalities in normotensive and hypertensive individuals. *J Hypertens* 2016; 34:959–966.
 24. De Simone G, Izzo R, Chinali M, De Marco M, Casalnuovo G, Rozza F, Girfoglio D, Iovino GL, Trimarco B, De Luca N. Does information on systolic and diastolic function improve prediction of

- a cardiovascular event by left ventricular hypertrophy in arterial hypertension? *Hypertension* 2010; 56:99–104.
25. Bombelli M, Facchetti R, Cuspidi C, Villa P, Dozio D, Brambilla G, Grassi G, Mancia G. Prognostic significance of left atrial enlargement in a general population: results of the PAMELA study. *Hypertension* 2014; 64:1205–1211.
26. Devereux RB, Wachtell K, Gerds E, Boman K, Nieminen MS, Papademetriou V, Rokkedal J, Harris K, Aurup P, Dahlöf B. Prognostic significance of left ventricular mass change during treatment of hypertension. *JAMA* 2004; 292:2350–2356.
27. Karmacharya BM, Koju RP, LoGerfo JP, Chan KC, Mokdad AH, Shrestha A, et al. (2017) Awareness, treatment and control of hypertension in Nepal: findings from the Dhulikhel Heart Study. *Heart Asia* 9: 1–8.
28. Devkota S, Dhungana RR, Pandey AR, Bista B, Panthi S, Thakur KK, et al. (2016) Barriers to Treatment and Control of Hypertension among Hypertensive Participants: A Community-Based Cross-sectional Mixed Method Study in Municipalities of Kathmandu, Nepal. *Front Cardiovasc Med* 3: 26.
29. Pathak SR, Bhattarai N, Baskota D, Koju RP, Humagain S. Prevalence of Microalbuminuria in Patients of Essential Hypertension and Its Correlation with Left Ventricular Hypertrophy and Carotid Artery Intima-media Thickness. *Kathmandu Univ Med J.* 2022;80(4):417-21
30. Ram Kumar Mehta, PuruKoirala, Ram L. Mallick, Surya Parajuli, Rajneesh Jha. Prevalence of Hyperuricemia and its Association with Sociodemography among Hypertensive Patients at Birat Medical College Teaching Hospital. *BJHS* 2021;6(1)14. 1388 – 1391.
31. Wald DS, Law M, Morris JK, Bestwick JP, Wald NJ. Combination therapy versus monotherapy in reducing blood pressure: meta-analysis on 11,000 participants from 42 trials. *Am J Med* 2009; 122:290–300.