Yadav et.al.
Screening and management of hypertension
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Original Article

Screening and management of hypertension in a General Practice Outpatient Department of a tertiary level teaching hospital in eastern region of Nepal

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Abstract

Background: Hypertension is a common disease affecting about 20% of the adult population, both in developed and developing world (WHO 2002). It is one of the serious public health problems. Timely detection, compliance with lifestyle modification and use of drugs are important for effective management of this condition. **Objective:** To find out the prevalence of systemic hypertension in the general outpatient department and to study the effect of drugs and lifestyle education on the blood pressure over time. **Methods:** This was an interventional series of cases involving diagnosis and management of patients with BP higher than 140/90 or with known hypertension. All the subjects included were given life style education to see the effect of change of life style on blood pressure over time. **Results:** A total of 258 subjects were screened and 145 (56%) were diagnosed as hypertensive. Of the total, 75 (29%) had a blood pressure level in pre- hypertensive range. Whereas, 42 (16.3%) had hypertension of stage 1, and 28 (11%) had hypertension of stage 2. Forty- nine patients came for first follow up, 40 patients for second and 10 patients for the third follow up. Blood pressure started to decrease with second follow up. **Conclusion:** This study demonstrated that the prevalence of hypertension is 56% in the general outpatient department. The lifestyle education can have positive impact on blood pressure control.

Key words: Hypertension, life style modification, prevalence.

Introduction

Hypertension is a common disease affecting about 20% of the adult population, both in developed and developing world (WHO 2002).[1] It is one of the serious public health problems of the world. Many people are unaware that they are hypertensive. Others have been diagnosed but fail to comply with treatment.

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Yadav et.al.
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Lowering blood pressure reduces the chance of cerebrovascular accidents.[1,2] Hypertension is also associated with co-morbidities such as diabetes, ischemic heart disease, hyperlipidaemia, and chronic kidney disease.[2] These chronic diseases need to be managed together. This research project focused on hypertension, but also addressed the other co-morbidities.

Strategies for screening and better management of these chronic diseases are urgently needed in primary care situations of countries like Nepal that are undergoing demographic transition. In the future it can be expected that the problem will be even bigger as the population distribution includes more old people.

Similar studies were found from the developed world, but not from Nepal or India. This study was designed to find out the prevalence of systemic hypertension and to follow up a subset of the diagnosed cases to look at changes in blood pressure over time. It also studied the effect of lifestyle education on the blood pressure over time

The motivation for this study was, therefore, to explore whether screening for hypertension in the General outpatient department (GOPD) waiting room was a useful tool for case finding of hypertension and whether following a protocol such as JNC7 would result in a measurable drop in blood pressure in these people.

Methods

This was an interventional series of cases done in the GOPD of BP Koirala Institute of Health Sciences (BPKIHS). A total of 258 patients were included in the study. The screening was done during outpatient hours and a convenience sampling method was used. Everyone of age more than 15 years in the waiting area of the GOPD was eligible for the study. The researcher made himself available for one hour every day for the research. Information about the screening process and research was given to everyone and those who volunteered for the research were taken as sample.

This study involved screening, diagnosis and management of the patients with blood pressure higher than 140/90 mmHg or known hypertension as per the Seventh Report of the Joint National Committee on the prevention, detection, evaluation and treatment of high blood pressure (JNC7). The persons who were diagnosed to have hypertension, were then counselled in terms of life style modification, investigated and treated as per the JNC 7 guidelines[12,14] (Table- 1).

Yadav et.al.
Screening and management of hypertension
Health Renaissance 2015;13(1): 58-67

Table 1: Classification and management of blood pressure for adults *

BP classification	SBP* mmHg	DBP* mmHg	Lifestyle modification	Initial drug therapy	
				Without compelling indication	**With compelling indications (see table 8)**
Normal	<120	and <80	Encourage	No antihypertensive drug indicated.	Drug(s) for compelling indications.‡
Prehypertension	120–139	or 80–89	Yes		
Stage 1 Hypertension	140–159	or 90–99	Yes	Thiazide-type diuretics for most. May consider ACEI, ARB, BB, CCB, or combination.	Drug(s) for the compelling indications.‡ Other antihypertensive drugs (diuretics, ACEI,ARB, BB, CCB) as needed.
Stage 2 Hypertension	≥160	or ≥100	Yes	Two-drug combination for most† (usually thiazide-type diuretic and ACEI or ARB or CCB).	

DBP,diastolic blood pressure; SBP, systolic blood pressure.

Drug abbreviations: ACEI, angiotensin converting enzyme inhibitor; ARB, angiotensin receptor blocker; BB, beta-blocker;CCB, calcium channel blocker.

* Treatment determined by highest BP category.

† Initial combined therapy should be used cautiously in those at risk for orthostatic hypotension.

‡ Treat patients with chronic kidney disease or diabetes to BP goal of <130/80 mmHg.

*BP recorded by mercury sphygmomanometer by ausculatory method, taken after rest of 5 minutes, at least 2 recordings.

A follow- up plan was then formulated for diagnosed hypertension cases. A total of three follow ups at 2 weeks, 4 weeks, and 3 months were planned. The patients living farther away could request to be referred to a local practitioner for follow-up and were considered lost to follow-up for the purpose of this study. The main outcome measure of the

Yadav et.al.
Screening and management of hypertension
Health Renaissance 2015;13(1): 58-67

study was to see the effect of drugs and life style modification on blood pressure.

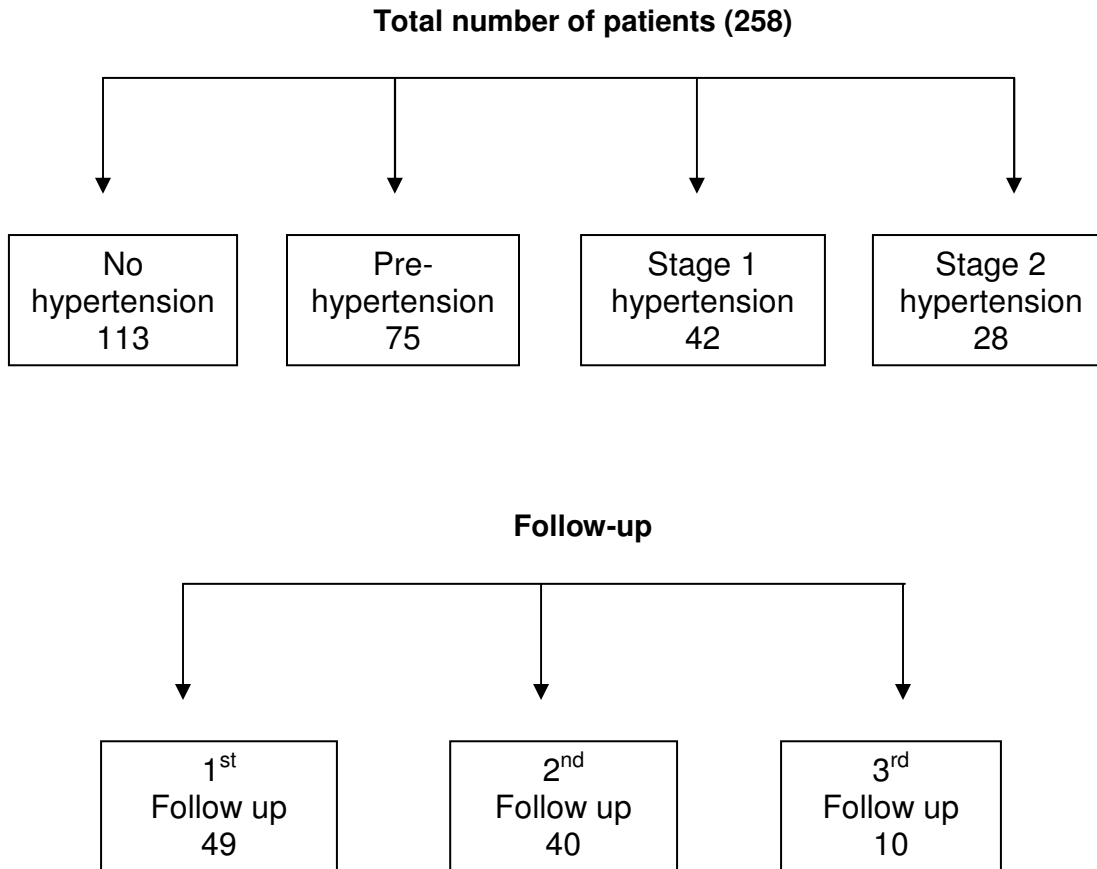An informed consent was taken from all the subjects included in the study.

Total number of patients (258)

No hypertension 113	Pre-hypertension 75	Stage 1 hypertension 42	Stage 2 hypertension 28

Follow-up

1st Follow up 49	2nd Follow up 40	3rd Follow up 10

Fig. 1: Study flow chart

Statistics

Data entry and analysis were performed using Excel, and SPSS software. Simple descriptive statistics were employed. The research complied with research guidelines given by the BPKIHS.

Results

A total of 258 subjects were examined and 145 were diagnosed to have hypertension in the initial screening. The blood pressure was in the normal range in the younger age groups, with a gradual increase in grades of hypertension with increasing age. Among females, the majority remained normotensive up until the sixth decade, whereas the male participants started to show a higher range of blood pressure by the fifth decade (Table-2).

Yadav et.al.
Screening and management of hypertension
Health Renaissance 2015;13(1): 58-67

Table 2: Age gender and stage of hypertension

Age group (years)	Normal		Pre-hyper-tension		Stage 1		Stage 2		Total	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
15-29	15	28	5	14	4	2	2	0	26	44
30-39	18	27	11	10	3	6	*1*	4	33	47
40-49	7	10	18	4	8	3	2	2	35	19
50-59	3	4	5	7	4	6	8	2	19	19
60+	0	1	0	1	5	1	4	3	10	6
Total	43 (35%)	70 (51.8%)	39 (32%)	36 (26.7%)	24 (20%)	18 (13.3%)	17 (14%)	11 (8.1%)	123 100%	135 100%

More than 30% of the screened population were smokers or had smoked regularly in the past and all of them were either regular or occasional drinkers. There was a small but statistically insignificant increase in number of positive family history conditions in cases with stage 1 and 2 hypertension (Tables 3 and 4).

Table 3: Personal history of screened population (n = 258)

Smoking		Alcohol			Physical activity	
Smoker	Ex-smoker	No	Regular	Occasional	<30 minute/day	>30 minute/day
68 (26.3%)	19 (7.4%)	171 (66.3%)	30 (11.6%)	228 (88.4%)	40 (15.6%)	118 (84.4%)

Table 4: Distribution of family history (n = 258)

	Family history of diseases	
	Yes	**No**
Kidney disease	9 *3.5%)	249 (96.5%)
Hypertension	72 (27.9%)	186 (72.1%)
Diabetes	33 (12.8%)	225 (87.2%)
Heart attack or stroke	8 (3.1%)	250 (96.9%)
Total	122 (47.3%)	136 (52.7%)

Yadav et.al.
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The waist circumference was less in normotensive in screened population than in the hypertensive people. The body- mass -index showed an increasing trend across different stages of hypertension (Table 5 and 6).

Table 5: Body Mass index and stage of hypertension

	Mean BMI (male)	SD	Mean BMI (female)	SD
Normal	21.5	4.2	22.3	4.03
Pre-hypertension	22.4	3.67	24.6	4.06
Stage 1	22.67	2.86	29.9	3.34
Stage 2	23.8	4	28.8	3.98
Any hypertension	22.8	3.5	22.8	3.8

Mean BMI between normal and any stage of hypertension, p==0.07 in male and p=0.004 in females.

Table 6: Waist circumference and waist hip ratio in hypertension

		FEMALE		MALE		
	Number	Mean waist circumference With SD	Mean Waist hip Ratio with SD	Number	Mean waist circumference with SD	Mean Waist hip Ratio with SD
Normal	70	81 (9.69)	0.89(0.08)	43	81.5(9.18)	0.9(0.08)
Pre-hypertension	36	86.64 (9.6)	0.9 (0.05)	39	85.4(9.48)	0.95(0.07)
Stage 1	18	85.06 (8.32)	0.89 (0.5)	24	88.7(9.46)	0.87(0.07)
Stage 2	11	84 (17.72)	0.9 (0.12)	17	92.8(10.72)	0.99(0.064)
Any Hypertension	70	85.8 (10.9)	0.902 (0.07)	80	88.0(10.04)	0.97(0.076)

Yadav et.al.
Screening and management of hypertension
Health Renaissance 2015;13(1): 58-67

Means of waist circumference between "normal" and "any stage of hypertension", p=0.001 in males and p=0.013 in females.

First follow-up at 2 weeks was attended by 49 persons. The mean blood pressure had not improved. In fact, the mean systolic blood pressure (SBP) increased by 3.14 mm Hg and the mean diastolic blood pressure (DBP) increased by 2.58 mm Hg. Forty people attended for second follow up after medication (mostly hydrochlorothiazide 12.5mg or 25mg). Compared to baseline, the SBP decreased by 9.15 mmHG and the DBP decreased by 2.93 mmHg. Ten people attended for 3rd follow-up. When compared to baseline, the SBP decreased by 27.2 mmHg and the DBP decreased by 15.0 mmHg (Table 7, 8 and 9).

Table 7: BP of those who attended 1st follow up

	Mean SBP	SD	Mean DBP	SD
Initial (n = 49)	144.53	22.78	92.73	12.68
FU1 (n = 49)	147.67	22.28	95.31	13.37
FU2 (n = 40)	133.25	16.91	88.95	9.88
FU3 (n = 10)	119	7.38	77.8	9.02

Discussion

The present study showed pre-hypertension or hypertension in 56% individuals, 75 (29%) had a blood pressure measurement in pre-hypertensive range, 42 (16.3%) had hypertension stage 1 and 28 (11%) had hypertension stage 2.

A similar study in the United States in a family medicine clinic found much higher nearly 80% of adults with pre-hypertension or hypertension.[9] No similar studies were found from Nepal in literature search.

Community based studies generally report lower rates than those in clinics or hospitals.

Community based studies have reported that the rates of hypertension to be between 3 and 27% in Nepal.[5] A recent community based door-to-door screening for chronic kidney disease, hypertension and diabetes in Dharan, Nepal found 38.6% of people over 20 years had high blood pressure. Of these, 47% were not previously diagnosed as hypertensive.[11]

Among those who had an abnormal measurement, approximately half of them were in the hypertensive range, whereas the other half were in pre-hypertensive range.

Yadav et.al.
Screening and management of hypertension
Health Renaissance 2015;13(1): 58-67

The fact that younger age and lower BMI are associated with normal blood pressure is not a surprise. The study showed a clear relationship between stages of hypertension and body mass Index in females (p=.004). Males also showed a trend of increasing blood pressure with BMI, but there was a stronger statistically significant relationship with waist circumference (p=.0001). The link between truncal obesity (as measured by waist circumference), or BMI, and cardiovascular risk is well known[7] and weight reduction is part of all the recommendations for non-pharmacological management of hypertension.[3,4,7] Our results confirm the importance of this advice.

Normal blood pressure was found to be more common in the younger age groups, with a gradual increase in grades of hypertension with increasing age. Overall, 113 (44%) were normotensive and most of these were young. Thirteen of the fifteen people of age 60 years and older had high blood pressure. The data given in the JNC7 report also highlights a strong link between blood pressure and age, in both men and women (JNC7). From this, it is clear that older age groups will have the highest yield from screening. However, previously undiagnosed cases were found in the under 30 age group also, and these people could potentially be those to benefit most from being diagnosed.

For those patients who came for follow-up, an improvement in their BP with treatment was clearly demonstrated over the longer term. At the initial visit, everyone received lifestyle modification advice and only those with graded hypertension were prescribed medications.

Mean blood pressure had not improved at the first follow-up at two weeks but started to show improvement on second follow up. The drop in blood pressure at 3rd follow-up did not achieve statistical significance, because only ten people came to all three follow-up visits. These ten people may also have been the most highly motivated participants who implemented lifestyle changes and therefore achieved the best results. As in any chronic disease, the value of regular follow up and compliance issues must be considered while managing hypertension. A research with longer follow up should be planned to validate this observation

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Yadav et.al.
Screening and management of hypertension
Health Renaissance 2015;13(1): 58-67

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Yadav et.al.
Screening and management of hypertension
Health Renaissance 2015;13(1): 58-67

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