R e s e a r c h   A r t i c l e

A Prospective Study on Assessment of Screening Risk Factors for Hypertension and Evaluation of Treatment Profile of Anti-Hypertensive Patients in a Tertiary Care Hospital

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A b s t r a c t

Hypertension is one of the most significant risk factors for morbidity and mortality worldwide and is responsible for the deaths of approximately nine million people annually. The prospective observational study was carried out for a period of 6 months. The study was conducted in general medicine department in a tertiary care hospital. A written and informed consent was obtained from the recruited patients. A Total of 410 patients were enrolled in the study. In our study 46-56 years age patients were more 137 (33.41%) as compared to other ages. In our study Male patients were more 211(51.46%) as compared to females. In our study Graduation education patients were more 193 (47.07%) as compared to other educational qualifications. Married patients were more 227(55.36%) as compared to other marital status of patients. The risk factors of hypertension include physically inactive patients were more 102(24.87%) as compared to other risk factors. Angiotensin Receptor Blockers prescribed patients was more 88(21.46%) as compared to other prescribed drugs. We conclude that with time, the choice of anti-hypertensive drugs reasonably complies with the JNC 8 guidelines on the management of hypertension, which confirms a fairly good degree of compliance by clinicians with JNC 8 guidelines.

Keywords: Hypertension, Angiotensin Receptor Blockers, physically inactive, JNC 8 guidelines.

A r t i c l e   I n f o

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C O N T E N T S

1. Introduction

Hypertension has been identified by WHO as one of the most significant risk factors for morbidity and mortality worldwide and is responsible for the deaths of approximately nine million people annually. In the UK, the

National Institute for Health and Care Excellence (NICE) defines high blood pressure (BP), also known as hypertension, as a clinic blood pressure of 140/90 mmHg or higher confirmed by a subsequent ambulatory blood pressure monitoring daytime average (or home blood pressure monitoring average) of 135/85 mmHg or higher.

High blood pressure does not just develop in older adults. Over 2.1 million people under 45 years old had high blood pressure in England in 2015. This is important because treating hypertension results in significant reductions in risk of subsequent cardiovascular disease. Despite strong evidence for such treatment, studies suggest that many people remain sub-optimally controlled. New approaches, including new technologies, are therefore needed to improve screening, detection and control of raised blood pressure in the community.

Screening

High blood pressure is largely asymptomatic, especially in the early stages, leading to its description as a 'silent killer'. The asymptomatic nature of hypertension in conjunction with its disease burden necessitates routine blood pressure screening. In the UK, NICE guidelines recommend blood pressure measurement at least yearly among normotensive adults and currently hypertension is largely identified in this way by physicians routinely or opportunistically assessing blood pressure in a primary care clinic setting. However, it has been estimated that between a third and a half of hypertensive patients remain undiagnosed, indicating the need for better screening. Developments in non-physician-based blood pressure measurements utilising new technologies may provide an opportunity for increased detection of hypertension[1].

Self-screening allows patients to measure their own blood pressure outside of physician consultations, either in their own home or with public validated solid cuff automatic sphygmomanometers that require no training, just simple instructions for use. In Japan, the market penetration of home blood pressure monitoring is such that it is estimated that more than enough monitors have been sold for one per household. In the UK, at least 1:10 normotensive adults have measured their own blood pressure at some time in the past. A recent systematic review identified three studies of self-screening, which utilised public blood pressure cuffs in a variety of settings including pharmacies and grocery stores (Hamilton 2003, Houle 2013, Nykamp 2016). The majority of these were conducted in North America, where out-of-office blood pressure self-screening stations in pharmacies and work places are estimated to be used more than one million times a day. Providing additional blood pressure self-monitoring equipment in physician waiting rooms has been proposed in the UK to increase blood pressure screening, and such monitors are available in around a third of practice in the UK. Whilst several studies to date show promising results for feasibility, patient autonomy,

convenience, and increased detection of hypertension number of barriers are yet to be overcome before widespread community self-screening can be recommended. These include limited privacy, poor awareness of the availability of the facilities, and a lack of education regarding the asymptomatic nature of hypertension and the benefits of screening.

Different classes of antihypertensive drugs have different mechanisms of action.

Thiazide and thiazide-like diuretics: The mechanism of action by which thiazide diuretics lower blood pressure in the long term is not fully understood. After chronic use, thiazides lower peripheral resistance. The mechanism of these effects is uncertain, as it may involve effects on the whole body, renal autoregulation, or direct vasodilator actions. Thiazides act on the kidney to inhibit reabsorption of sodium (Na^+) and chloride (Cl^-) ions from the distal convoluted tubules in the kidneys, by blocking the thiazide-sensitive sodium-chloride symporter. They also increase calcium reabsorption at the distal tubule, and increase the reabsorption of calcium ions (Ca^{2+}), by a mechanism involving the reabsorption of sodium and calcium in the proximal tubule in response to sodium depletion.

Beta-blockers:

Beta-blockers are competitive antagonists that block the receptor sites for epinephrine (adrenaline) and norepinephrine on adrenergic beta-receptors. Some block activation of all types of beta-adrenergic receptors (β_1, β_2, and β_3), and others are selective for one of the three types of beta receptors.

Angiotensin converting enzyme (ACE) inhibitors:

ACE inhibitors block the conversion of angiotensin I (AI) to angiotensin II (AII), and thus decrease the actions of angiotensin II. The end result is to lower arteriolar resistance and increase venous capacity; decrease cardiac output, cardiac index, stroke work, and volume; lower resistance in blood vessels in the kidneys; and increase excretion of sodium in the urine. Renin and AI increases in concentration in the blood as a result of negative feedback of the conversion of AI to AII. AII and aldosterone levels decrease. Bradykinin increases, because ACE is also responsible for inactivation of bradykinin[2-6].

Angiotensin receptor blockers (ARBs):

ARBs block the activation of angiotensin II AT_1 receptors. Blockage of AT_1 receptors directly causes vasodilation, reduces secretion of vasopressin, and reduces the production and secretion of aldosterone.

Calcium channel blockers (CCBs):

CCBs block calcium channel and inhibit calcium ion influx into vascular smooth muscle and myocardial cells. They reduce blood pressure through various mechanisms: by vasodilation, by reducing the force of contraction of the heart, by slowing the heart rate, and by directly reducing aldosterone production.

Alpha blockers: α_1 adrenergic receptor blockers inhibit the binding of norepinephrine (noradrenaline) to the α_1 receptors on vascular smooth muscle cells. The primary

effect of this inhibition is vasodilation, which decreases peripheral vascular resistance, leading to decreased blood pressure.

2. Methodology
Study Design: It was Prospective observational study.
Study Period: The Present study was conducted for a period of six months.
Study site: The Present study was conducted in department of general medicine department in a tertiary care hospital.
Sample size: It was 410 Patients.
Inclusion criteria

- Patients with age of more than 18 years.
- Patients with hypertension symptoms.
- Patients of either sex, diagnosed with hypertension.
- Patients who are willing to give consent.
- Patients under hypertension treatment.

Exclusion criteria
- Patients below 18 years.
- Patients who were not willing to join in the study.
- Special population including pregnant women and lactating women.
- Psychiatric abnormalities.

3. Results and Discussion
Table 1: Age
In our study 25-30 years age patients were 78 (19.02%), 31-39 years age patients were 93(22.68%), 40-45 years age patients were 102(24.87%), 46-56 years age patients were 137 (33.41%).

S.No	Age	Total N=410	Percentage (%)
1.	25-30	78	19.02
2.	31-39	93	22.68
3.	40-45	102	24.87
4.	46-56	137	33.41
	Total	410	

Table 2: Gender
In our study Male patients were 211(51.46%), Female patients were 199 (48.53%).

S.No	Gender	Total N=410	Percentage (%)
1	Males	211	51.46
2	Female	199	48.53
	Total	410	

Table 3: Education
Primary education patients were 91(22.19%), Secondary education patients were 126 (30.73%), Graduation education patients were 193 (47.07%).

S.No	Education	Total N=410	Percentage (%)
1.	Primary	91	22.19
2.	Secondary	126	30.73
3.	Graduation	193	47.07
	Total	**410**	

Table 4: Marital status
Single patients were 45 (10.97%), Married patients were 227(55.36%), Divorced patients were 138 (33.65%).

S.No	Marital status	Total N=410	Percentage (%)
1.	Single	45	10.97
2.	Married	227	55.36
3.	Divorced	138	33.65
	Total	**410**	

Table 5: Risk factors
Risk factors of hypertension includes Obesity patients were 67(16.34%), Stress patients were 92(22.43%), Physically inactive patients were 102(24.87%), High salt patients were 87(21.21%), Smoking patients were 40(9.75%), Alcohol patients were 22(5.36%).

S.No	Risk factors	Total N=410	Percentage (%)
1.	Obesity	67	16.34
2.	Stress	92	22.43

3.	Physically inactive	102	24.87
4.	High salt	87	21.21
5.	Smoking	40	9.75
6.	Alcohol	22	5.36
	Total	**410**	

Table 6: Clinical symptoms of hypertension

The Clinical symptoms of hypertension includes Headache patients were 92(22.43%), Chest pain patients were 122(29.75%), Dizziness patients were 151(36.82 %), Anxiety patients were 30(7.31 %), Confusion patients were 15 (3.65%).

S.No	Clinical symptoms	Total N=410	Percentage (%)
1	Headache	92	22.43
2	Chest pain	122	29.75
3	Dizziness	151	36.82
4	Anxiety	30	7.31
5	Confusion	15	3.65
	Total	**410**	

Table 7: Duration of hypertension

Duration of hypertension includes 1-3 years patients were 133(32.43%), 4-5 years patients were 108(26.34%), 6-7 years patients were 169 (41.21%).

S.No	Duration	Total N=410	Percentage (%)
1	1-3 years	133	32.43
2	4-5 years	108	26.34
3	6-7 years	169	41.21
	Total	**410**	

Table 8: Comorbidities

The Comorbidities includes Renal failure patients were 93(22.68), Diabetes mellitus patients were 77(18.78), Peptic ulcer disease patients were 131(31.95), Stroke patients were 98(23.90), Alcoholic liver disease patients were 11(2.68).

S.No	Comorbidities	Total N=410	Percentage (%)
1	Renal failure	93	22.68
2	Diabetes mellitus	77	18.78
3	Peptic ulcer disease	131	31.95
4	Stroke	98	23.90
5	Alcoholic liver disease	11	2.68
	Total	**410**	

Table 9: Prescribing pattern of Antihypertensive

Angiotensin Receptor Blockers prescribed patients were 88(21.46%), ACE inhibitors prescribed patients were 51(12.43%), Beta blockers prescribed patients were 54(13.17%), Calcium channel blockers prescribed patients were 43(10.48%), Diuretics prescribed patients were 36(8.78%), Alpha blockers prescribed patients were 71(17.31%), Vasodilators prescribed patients were 22(5.36%), ARB's prescribed patients were 45 (10.97 %),

S.No	Prescribing pattern of NSAID'S	Total N=410	Percentage (%)
1	Angiotensin Receptor Blockers	88	21.46
2	ACE inhibitors	51	12.43
3	Beta blockers	54	13.17
4	Calcium channel blockers	43	10.48
5	Diuretics	36	8.78
6	Alpha blockers	71	17.31
7	Vasodilators	22	5.36
8	ARB's	45	10.97
	Total	**410**	

Discussion

- In our study 46-56 years age patients were more 137 (33.41%) as compared to other ages.
- In our study Male patients were more 211(51.46%) as compared to females.
- In our study Graduation education patients were more 193 (47.07%) as compared to other educational qualifications.
- Married patients were more 227(55.36%) as compared to other marital status of patients.
- The risk factors of hypertension includes Physically inactive patients were more 102(24.87%) as compared to other risk factors[7-13].
- Dizziness clinical symptom patients were more 151(36.82 %) as compared to other clinical symptoms.
- In our study 6-7 years duration hypertensive patients were more 169 (41.21%) as compared to other hypertensive durations.
- Peptic ulcer disease comorbid condition patients were more 131(31.95) as compared to other comorbid condition patients.
- Angiotensin Receptor Blockers prescribed patients were more 88(21.46%) as compared to other prescribed drugs.

4. Conclusion

In our study, for the treatment of hypertension ARB were commonly prescribed medicines. We conclude that with time, the choice of anti-hypertensive drugs reasonably complies with the JNC 8 guidelines on the management of hypertension, which confirms a fairly good degree of compliance by clinicians with JNC 8 guidelines[14-15]. However, there is a need for improved patient education on medication adherence and greater attention by clinicians to issues of lifestyle modifications, to improve the BP control rate in this hospital.

5. Reference

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