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Research Article

CHECK THE ORDER OF PRESCRIPTION OF ANTIHYPERTENSIVE AGENTS AND THEIR ACTION ON BLOOD PRESSURE CONTROL

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Abstract:

Background: Hypertension is included in one of the world most famous disease which is being treated both at monotherapy and common drug level.

Objective: The purpose of this study was to check the order of prescription of antihypertensive agents and their action on blood pressure control between hypertensive patients with BMI higher than or lower than 25.

Patients and Methods: The sample of this study was manipulated on 150 patients admitted hypertensive patients from 1st April 2017 to 30th June 2018 at Mayo Hospital, Lahore. Only previously known hypertensive patients with or without the complication of hypertension were added in this study, However, newly diagnosed cases or treated as outdoor patients, having white coat hypertension or having indeterminate biography of hypertension were eliminated from the study. A list of question containing biographic details, BP record, associated comorbidities, BMI, the basic biochemical profile including RBS, antihypertensive drug or drugs combination used and any injurious effect was used. By using SPSS, the data was managed.

Results: In our study Amlodipine was only calcium channel blocker prescribed, in all cases, it was given to 43 (28.7%), ACEI were prescribed to 45 (30%) of all cases (lisinopril 20%, enalapril 2.6%, ramipril 7.3%). In all cases ARBs were 7 (4.6%) given, 48 (32%) diuretic were given, and 7 (4.6%) beta blockers were given to all patients. 48 (32%) of the patients, the combination was given and as a second-line therapy when one aforementioned drug failed. The target was achieved by 125 patients BP less than 140/90 mmHg by using antihypertensive medication however, target BP was failed to achieve by 33% patients. It was observed that DM of 54% of the subjects was massive and 10% having nephropathy and proteinuria. It was also observed that the history of MI and a history of strokes was 13% and 5% respectively.

Conclusion: In this study, it is deduced that tertiary care of Services hospital, use Amlodipine, lisinopril and diuretic as a leading drug. It is also observed that when BMI increases, antihypertensive drugs slowly lose their effectiveness in controlling BP.

Key Words: Hypertension, Disease, Monotherapy, Drugs, Prescription, Antihypertensive, Blood Pressure, Agents, BMI and Red Blood Cells.

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INTRODUCTION:

Hypertension is the most abundant disease and a serious risk factor for the myocardial infarction, stroke and chronic kidney disease. In 2008 frequency of raised blood pressure in adult aged over 25 years was 40% in all over the world. 75 A million adults are engaged by hypertension in the United States and only one third in these have blood pressure not out of control. National Health Survey in Pakistan has seemed that hypertension affected the 18% adults and 33% of adults above 45 years. It has been recorded that in USA and India 35% and 6% respectively control of blood pressure remains poor. Diagnosed was given only 50% of patients of hypertension and half patients were recovered so only 12.5% hypertension cases were controlled.

Hypertension is treated by medically, range from monotherapy to combination therapy with the help of antihypertensive agents like calcium channel blocker, beta blocker and diuretics. In fat patient blood pressure control is tougher as compared to other patients. The purpose of this study to check the sequence of antihypertensive agents and their action on blood pressure control among hypertensive patients with BMI over or under 25.

PATIENTS AND METHODS

The sample of this study was manipulated on 150 hospitals admitted hypertensive patients from 1st April 2017 to 30th June 2018 at Mayo Hospital, Lahore. These patients were reviewed for next 2 months after release to check the effectiveness of the prescribed hypertensive drugs and also reviewed to check the achieving target blood pressure in accordance with European Society of Hypertension, European Society of Cardiology, 2015 (ESH-ESC) and American Joint National Committee JNC-7 Guidelines. Target blood pressure was considered as less than 140/90 mmHg. Normal blood pressure range was taken as less than 120/80 mmHg, prehypertensive stage (Systolic BP 120-139 and diastolic BP 80-89mmHg). In hypertension stage, I and stage II systolic BP 140-160 and diastolic BP 99-99mmHg, systolic BP more than 160mmHg and diastolic BP more than 100mmHg respectively were taken. Only previously know hypertensive patients with may or may not complications of hypertension be considered in this study. Those patients were keeps out from the study which have newly diagnosed or treated outside from the hospital, having white coat hypertension or having an unclear history of hypertension. After discharge from the hospital, these patients were reviewed for the next two months and their blood pressure was checked in every call. A detailed list of question which contains biographic

details, BP record, BMI, associated commodities, baseline biochemical profile containing RBS, RFTS, ECG and echocardiography in patients, evidence of end-organ damage, antihypertensive drug or drugs combination used and any counter effect was used. The ethics committee of the hospital had confirmed this study and informed consent was taken from all patients. By using SPSS, the data was processed.

RESULTS:

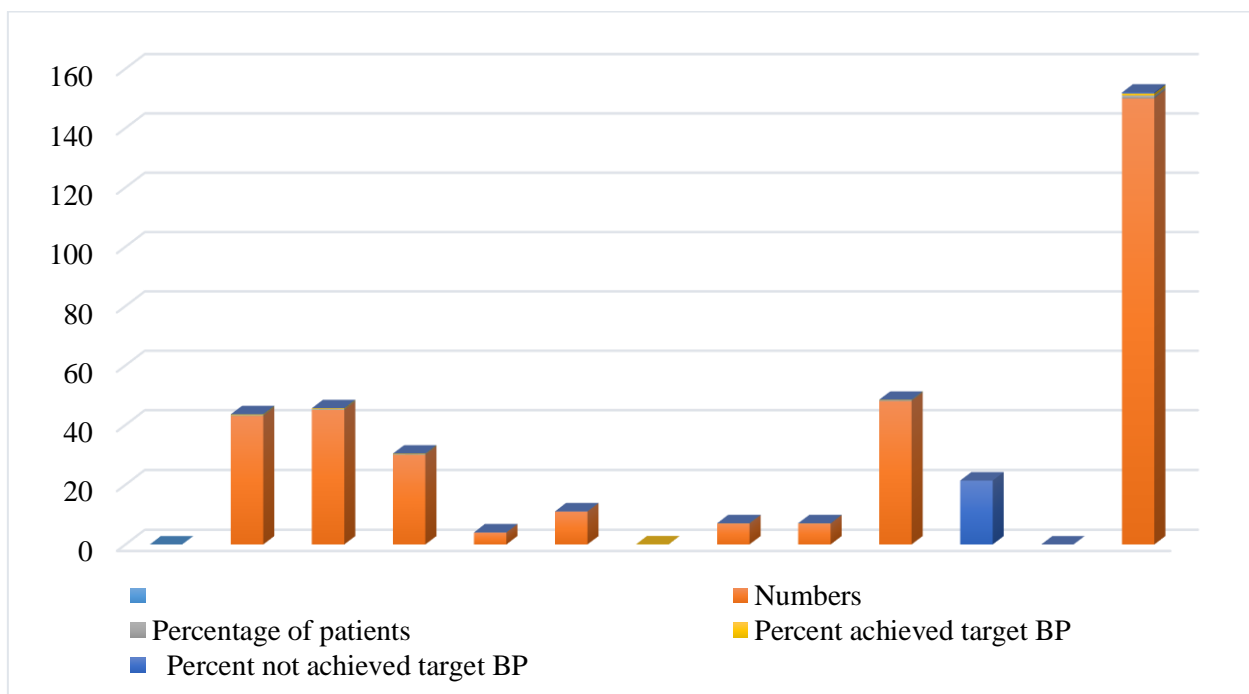
This study was only contained 150 patients with a mean BMI of 23.96. Only one calcium channel blocker Amlodipine was advised, which was given to 43 (28.7%) of all cases. ACEi were advised 45 (30%) of cases (lisinopril 20%, enalapril 2.6%, ramipril 7.3%). ARBs were given to 7 (4.6%), diuretic was given to 48 (32%) and beta channel blockers were given to 7 (4.6%) patients.

When one of the mentioned drugs not work, as a second line therapy combination was given to 48 (32%) patients. Target BP less than 140/90mmHg was attained by 125 patients by using antihypertensive medication, however, only 33% of patients failed to attain target BP. It was also noted that 25.7% in these patients were not responder having BMI > 25 and 17% were having diabetes as well. Target BP was attained by 25.7% patients having BMI less than 25 and 17% were having diabetes as well. Patients who were putted in amlodipine, 37 (24.6%) attain target BP and there BMI was less than 25, whereas at the same BMI 6 patients had still in stage II hypertension. Bad effect was appeared in 4 out of 43 patients, mostly constipation and angioedema. In all patient's beta channel blockers were given only 7 (4.6%) patients mostly females 5 out of 7. Amongst the beta blockers, 5 patients had taken atenolol and 2 patients had BMI in normal range attained target BP however, 3 patients had BMI greater than 25 and they were failed to attain target BP. Two patients had BMI (23 and 27), bisoprolol was given and each of them had attained target BP.

ACE inhibitors/ARBs were supplied to 52 (35%) patients and each of them describes effect same as the effect of amlodipine. In these 52 patients, lisinopril was given to 30 (20%) patients and 27 (18%) patients attain target BP, there BMI was less than 25 while 3 (2%) patients failed to attain target BP and there BMI was more than 25. 4 (2.6%) patients had taken enalapril and 3 patients attain target BP, there BMI groups were both more than and less than 25. 11 (7%) patients had taken ramipril and 8 patients attained target BP, there BMI was less than 25. 7 (4.6%) patients had taken ARBs and 6 patients attained target BP.

Table – I: Drug prescribed and blood pressure control (150)

Drug	Numbers	Percentage of patients	Percent achieved target BP	Percent not achieved target BP
Amlodipine	43	28.7%	24%	4.7%
ACEi	45	30%	25.5%	4.5%
Lisinopril	30	20%	18%	2%
Enalapril	4	2.6%	2%	1%
Ramipril	11	7.3%	5.5%	1.5%
ARBs	7	4.6%	4.1%	0.5 %
Beta Blockers	7	4.6%	2.8%	1.8%
Diuretics (incombination)	48	32.1%	10.6%	21.4%
Total	150	100%	67%	33%



48 (32%) patients had taken diuretics and amongst these furosemides 40 – 60 mg was given stat intravenous for short term relief. 25% patients out of total reacted extremely to IV furosemide and 10% were moved to oral furosemide, thiazide or spironolactone, for enhanced control in summation to other drugs as combination therapy on the long term. During this study, it was observed that 54% of study subjects were having DM overweight, with 10% having nephropathy and proteinuria. It was observed that 5% and 13% were having a history of strokes and a history of MI respectively.

DISCUSSION:

Hypertension and obesity outbreak and are often observed in combination. Selection of antihypertensive agents for different patients has a subject of many studies and resulting in national guidelines. Drug administration and dosage depend on the patient's age, clinical condition and organ damage.

Increase in weight is due to an increase in arterial pressure, it has been considering that adiposity causes 60-70% hypertension in adults. Cross-sectional and longitudinal studies document an affiliation of blood pressure increases with weight even among lean individuals.

The pattern of antihypertensive drug therapy and action of these drugs on patients with unique BMI is discussed in our study. Amlodipine was a single drug showed in our study as a most authorized drug and followed by ACEi and deurtic in combination with other antihypertensive agents. Observation tells us that those patients which have high BMI there BP are more difficult to control and to achieve powerful control on BP in adverse patient's antihypertensive drug be given in increasingly high doses or be disposed of in combination with further drugs. Control over the BP via medication can be made better by losing weight, even hypertension incidence and blood pressure can be control if weight is losing slowly and make improvement in insulin sensitivity and vascular endothelial function [12, 13]. In our study it is also observed that patients whose BMI is going increase, the effectiveness of antihypertensive drugs become down in comparison to rather lean individuals anyhow enalapril was the only drug establish to be comparatively more effective in fat individuals as compared to patients with normal BMI, however, Enalapril has advised for only a few patients.

Amlodipine is most advising drug among with calcium channel blocker and lisinopril followed by ramipril, amid the ACE inhibitors which were frequently advised in combination with ARBs unusually losartan and valsartan. The efficiency of a combination of hydrochlorothiazide has been recorded with either an ACE, an ARB, in overweight hypertensive patients [14]. Control on BP for a long time these drugs show their effectiveness while for asymptomatic comfort diuretics (Furosemide, thiazide) captopril are used and these have bounded performance for long term BP control. Although sympathetic nerve activity and the renin-angiotensin system both of them can be inspired by these drugs (diuretics), thiazide districts and hydrochlorothiazide controlled for a long time and has been depending with increased in insulin resistance and dyslipidaemia [15]. In the study of 232 fat hypertensive patients' hydrochlorothiazide was productive as the angiotensin rehabilitate enzymes ACE inhibitor, lisinopril in reducing blood pressure, but during used as monotherapy showed lower efficacy at a lower dose and had a slower rate of reaction than was accomplished with the ACE inhibitor.

We noted in our study that majority of patients were free from bad effects of antihypertensive medication and only 4% of patients containing bad effects mostly constipation and angioedema with calcium channel blocker and cough with ACE inhibitor. In the study, 54% of patients were having concomitant diabetes

mellitus and were fats showing the presence of the metabolic syndrome. It was also noted in our study that 10% patients were diagnosed with diabetic nephropathy and hypertension were put on ACE inhibitors likely the most reasonable form of antihypertensive agents for overweight hypertensive patients, as they utilize the range of hypotensive effects [16]. Fat hypertensive patients may also choose ACE inhibitor drug because of the majority association of obesity with left-ventricular hypertrophy, congestive heart failure, renal hyper filters and microalbuminuria [17], a situation known to be positively transformed by ACE inhibition.

Our study also showed that myocardial infarction was present in 13% hypertensive patients, 5% with stroke and on the question, it was noted that complications of hypertensive were due to poor drug docility.

CONCLUSION:

Observation tells us that tertiary care hospital of Lahore frequently uses Amlodipine, lisinopril and diuretics. Observation also tells us that with an increase of BMI efficacy of antihypertensive drugs in controlling BP gradually decreases, in this case, Enalapril is the only drug which is more effective to control BP in patients with high BMI. Some antihypertensive agents have unwanted adverse effects on some of the metabolic and hydrodynamic abnormalities that are related to fats and hypertension, yet most hypertension guidelines fail to provide specific advice on the pharmacological management of fat hypertensive patients due to deficiency of satisfactory studies to check the efficacy of antihypertensive drugs in fat patients therefore it is need of time to study further and determine the effectiveness of a specific class of antihypertensive agents in overweight patients, so that the hypertension patients with high BMI can be managed accurately.

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