



A Review on: Study on Drug Utilization Pattern of Anti- Hypertensive at A Tertiary Care Teaching Hospital

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ABSTRACT

Hypertension is a chronic illness associated with high morbidity and mortality. Once hypertension is diagnosed, starting antihypertensive therapy on a long-term basis along with regular follow up is important. The main objective of the study is to assess the utilization pattern of antihypertensive in a tertiary care hospital at Coimbatore. A prospective observational study was conducted for a period of ten months from November 2017 to August 2018 in general medicine department of Sri Ramakrishna Hospital, Coimbatore. A total of 102 prescriptions were analysed. Through the current study, we could assess the drug utilization pattern of antihypertensive in general medicine department. The study report shows male population was higher compared to female. Diabetes mellitus was the predominant diagnosis in general medicine department. Calcium channel blocker followed by beta blockers were the most frequently utilized drugs in the study. Among calcium channel blocker and beta blockers, amlodipine and atenolol were highly utilized in general medicine department respectively. The study also identified various risk factor associated in hypertensive patients where smoking was the most affecting factor. The current study assessed the major drug interactions which were found to be highly significant. Identifying and monitoring drug interactions helps in forming a standard therapeutic plan. It has provided an insight into the prescription patterns of antihypertensive medications with respect to the level of BP control. It will help prescribers to pay more attention that affect outcome of BP. The trend of hypertension is on the rise, if treated rationally this disease can be overcome.

Introduction

The principal aim of drug utilization research is to facilitate the rational use of drugs in populations. For the individual patient, the rational use of a drug implies the prescription of a well-documented drug at an optimal dose, together with the correct information, at an affordable price. Drug utilization research also provides insight into the efficiency of drug use, i.e. whether a certain drug therapy provides value for money and the results of such research can be used to help to set priorities for the rational allocation of health care budgets¹. High blood pressure is defined as a systolic blood pressure (BP) ≥ 140 mm Hg and/or diastolic blood pressure ≥ 90 mm Hg². The diastolic pressure represents the pressure during ventricular relaxation in diastole whereas the systolic pressure represents the peak pressure due to ventricular contraction during systole. Either or both pressures have specified upper limits of normal and elevation in either or both pressures are used to define hypertension³ According to the seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure JNC 7th report (2004) defined and classified hypertension

Blood Pressure Categories in Adults (Current Guidelines)			
Category	Systolic (mmHg)		Diastolic (mmHg)
Normal	< 120	And	< 80
Elevated	120 – 129	And	< 80
Hypertension			
Stage 1	130 – 139	Or	80 – 89
Stage 2	≥ 140	Or	≥ 90

Signs and Symptoms:

The primary hypertension patient may be generally asymptomatic or may impose serious cardiovascular disease risk factors, perhaps America Heart Association, mentions cardiovascular risk factors associate with age, gender, heredity, smoking, high lipid profile, obesity and overweight, Diabetes mellitus.

Adult patients with an average of two or more previous elevated blood pressure readings²

Causes:

Despite the fact that the definite reasons for hypertension are generally obscure, there are a few variables that have been very connected with the condition. These include:

- Smoking
- Obesity or being overweight
- Being stout/overweight as a kid
- Diabetes
- Sedentary way of life
- Lack of physical action
- High levels of salt admission (sodium affectability)
- Insufficient calcium, potassium, and magnesium utilization
- Vitamin D lack
- High levels of liquor utilization
- Stress
- Aging
- Medicines, for example, conception prevention pills
- Genetics and a family history of hypertension (a few qualities in the kidneys may add to hypertension)
- Chronic kidney sickness
- Adrenal and thyroid issues or tumors⁵

Medications to Treat High Blood Pressure:

Thiazide diuretics:

Diuretics, sometimes called water pills, are medications that act on your kidneys to help your body eliminate sodium and water, reducing blood volume. Thiazide diuretics are often the first, but not the only, choice in high blood pressure medications. Thiazide diuretics include hydrochlorothiazide (Microzide), chlorthalidone and others.

If you're not taking a diuretic and your blood pressure remains high, talk to your doctor about adding one or replacing a drug you currently take with a diuretic. Diuretics or calcium channel blockers may work better for black and older people than do angiotensin-converting enzyme (ACE) inhibitors alone. A common side effect of diuretics is increased urination.

Beta blockers:

These medications reduce the workload on your heart and open your blood vessels, causing your heart to beat slower and with less force. Beta blockers include acebutolol (Sectral), atenolol (Tenormin) and others.

When prescribed alone, beta blockers don't work as well, especially in black and older people, but may be effective when combined with other blood pressure medications.

Angiotensin-converting enzyme (ACE) inhibitors:

These medications — such as lisinopril (Zestril), benazepril (Lotensin), captopril (Capoten) and others — help relax blood vessels by blocking the formation of a natural chemical that narrows blood vessels. People with chronic kidney disease may benefit from having an ACE inhibitor as one of their medications.

Angiotensin II receptor blockers (ARBs):

These medications help relax blood vessels by blocking the action, not the formation, of a natural chemical that narrows blood vessels. ARBs include candesartan (Atacand), losartan (Cozaar) and others. People with chronic kidney disease may benefit from having an ARB as one of their medications.

Calcium channel blockers:

These medications — including amlodipine (Norvasc), diltiazem (Cardizem, Tiazac, others) and others — help relax the muscles of your blood vessels. Some slow your heart rate. Calcium channel blockers may work better for black and older people than do ACE inhibitors alone. Grapefruit juice interacts with some calcium channel blockers, increasing blood levels of the medication and putting you at higher risk of side effects. Talk to your doctor or pharmacist if you're concerned about interactions.

Renin inhibitors:

Aliskiren (Tekturna) slows down the production of renin, an enzyme produced by your kidneys that starts a chain of chemical steps that increases blood pressure.

Tekturna works by reducing the ability of renin to begin this process. Due to a risk of serious complications, including stroke, you shouldn't take Aliskiren with ACE inhibitors or ARBs⁶.

Additional medications sometimes used to treat high blood pressure:

If you're having trouble reaching your blood pressure goal with combinations of the above medications, your doctor may prescribe:

Alpha blockers:

These medications reduce nerve impulses to blood vessels, reducing the effects of natural chemicals that narrow blood vessels. Alpha blockers include doxazosin (Cardura), prazosin (Minipress) and others.

Alpha-beta blockers:

In addition to reducing nerve impulses to blood vessels, alpha-beta blockers slow the heartbeat to reduce the amount of blood that must be pumped through the vessels. Alpha-beta blockers include carvedilol (Coreg) and labetalol (Trandate).

Central-Acting Agents:

These medications prevent your brain from signalling your nervous system to increase your heart rate and narrow your blood vessels. Examples include clonidine (Catapres, Kapvay), guanfacine (Intuniv, Tenex) and methyldopa.

Vasodilators: These medications, including hydralazine and minoxidil, work directly on the muscles in the walls of your arteries, preventing the muscles from tightening and your arteries from narrowing.

Aldosterone antagonists: Examples are spironolactone (Aldactone) and eplerenone (Inspra). These drugs block the effect of a natural chemical that can lead to salt and fluid retention, which can contribute to high blood pressure.

To reduce the number of daily medication doses you need, your doctor may prescribe a combination of low-dose medications rather than larger doses of one single drug. In fact, two or more blood pressure drugs often are more effective than one. Sometimes finding the most effective medication or combination of drugs is a matter of trial and error⁶.

Prevalence and Associated Risk Factors of Hypertension:

Raised blood pressure is a major risk factor for chronic heart disease, stroke, and coronary heart disease. Elevated BP is positively correlated to the risk of stroke and coronary heart disease. Other than coronary heart disease and stroke, its complications include heart failure, peripheral vascular disease, renal impairment, retinal haemorrhage, and visual impairment.

It is a silent killer as very rarely any symptom can be seen in its early stages until a severe medical crisis takes place like heart attack, stroke, or chronic kidney disease. Since people are unaware of excessive blood pressure, it is only through measurements that detection can be done. Although majority of patients with hypertension remain asymptomatic, some people with HTN report headaches, light-headedness, vertigo, altered vision, or fainting episode⁷

Adverse Effects Associated with the Use of Antihypertensive Drugs:***1. Thiazide Diuretic:***

Erectile dysfunction is adverse effect of the thiazide-class diuretics, and physicians should inquire specifically regarding its occurrence in conjunction with treatment with these drugs. Gout may be a consequence of the hyperuricemia induced by these diuretics. Hydrochlorothiazide may cause rapidly developing, severe hypernatremia in some patients. Thiazide diuretics have been associated with changes in plasma lipids and glucose tolerance that have led to some concern. The clinical significance of the changes has been disputed.

2. Angiotensin-Converting Enzyme Inhibitor:

Severe hypotension can occur after initial doses of any ACE inhibitor in patients who are Hypovolemic due to diuretics, salt restriction, or gastrointestinal fluid loss. Other adverse effects Common to all ACE inhibitors include acute renal failure, hyperkalemia, dry cough sometimes accompanied by wheezing, and angioedema. Captopril, particularly when given in high doses to patients with renal insufficiency, may cause neutropenia or proteinuria. Minor toxic effects seen more typically include altered sense of taste, allergic skin rashes, and drug fever, which may occur in as many as 10% of patients.

3. Angiotensin II Receptor Blocker:

Infrequent ADRs associated with therapy include: first dose orthostatic hypotension, rash, diarrhoea, dyspepsia, abnormal liver function, muscle cramp, myalgia, back pain, insomnia, decreased haemoglobin levels, renal impairment, pharyngitis, and/or nasal congestion.

The Adverse effects include hypotension, hyperkalaemia, and reduced renal function, including that associated with bilateral renal artery stenosis and stenosis in the artery of a solitary kidney. Hypotension is most likely to occur in patients in whom the blood pressure is highly dependent on angiotensin II, including those with volume depletion, renovascular hypertension, cardiac failure, and cirrhosis; in such patients initiation of treatment with low doses and attention to blood volume is essential. Hyperkalaemia may occur in conjunction with other factors that alter K⁺ homeostasis, such as renal insufficiency, ingestion of excess K⁺, and the use of drugs that promote K⁺ retention.

4. Beta-Blocker:

Adverse drug reactions associated with the use of beta blockers include: nausea, diarrhoea, bronchospasm, dyspnoea, cold extremities, exacerbation of Raynaud's syndrome, bradycardia, hypotension, heart failure, heart block, fatigue, dizziness, abnormal vision, decreased concentration, hallucinations, insomnia, nightmares, clinical depression, sexual dysfunction, erectile dysfunction and/or alteration of glucose and lipid metabolism.

5. Calcium Channel Blocker:

The most common side effects caused by the Ca²⁺ channel antagonists, particularly the dihydropyridines, are due to excessive vasodilatation. Symptoms include dizziness, hypotension, headache, flushing, digital dysesthesia, and nausea. Patients also may experience constipation, peripheral oedema, and coughing, wheezing, and pulmonary oedema. Nimodipine may produce muscle cramps when given in the large doses required for a beneficial effect in patients with subarachnoid haemorrhage. Less common side effects include rash, somnolence, and occasional minor elevations of liver function tests. These side effects usually are benign and may abate with time or with dose adjustment. Worsened myocardial ischemia has been observed in two studies with the dihydropyridine nifedipine⁸.

Drugs	Adverse drug reactions
Calcium channel blockers	
Amlodipine	Pedal oedema , Oedema,
	Headache, abdominal pain,
	Swelling of face, Giddiness
Nifedipine	Bradycardia
Beta-blockers	

Atenolol	Hypotension, Giddiness,
	Headache , Bradycardia
Metoprolol	Impotence, Bronchospasm,
	Irritation over whole body
Nebivolol	Pedal oedema
ACE Inhibitors	
Ramipril	Dry cough
Enalapril	Dry cough
Telmisartan	Dry cough
Furosemide	Hypotension, Bradycardia
Hydrochloro-thiazide	Muscle cramps, Headache,
	Vertigo , Pain in legs
Prazosin	Headache, Postural hypotension

The Extent of Potential Antihypertensive Drug Interactions:

Adverse drug events (ADEs) are one of the most frequent and costly consequences of medical errors occurring in up to 40% of patients on five or more medications. Costs of drug-related morbidity exceed \$177 billion and lawsuits with financial judgments occurred with 56% when there was permanent disability. It has been estimated that 6% to 10% of ADE are due to drug interactions. Fifty percent to 84% of ADEs are preventable with proper identification and surveillance. Nearly all hospital and outpatient pharmacies have computer software or online services to detect drug interactions, yet many drug interactions go unresolved. Many drug interactions are insignificant and pharmacists over-ride up to 88% of online alerts. Most interactions can be managed by appropriate monitoring and dosage adjustments and pharmacists frequently assume these adjustments are being done by the physician.

The Institute of Medicine report suggested that ADEs might be minimized by computer order entry that alerted physicians when there is a dosage error or drug interaction detected. However, if interaction alerts become so common that physicians ignore them, the utility of these programs is diminished.

The purpose of this article is to characterize potential drug–drug interactions with common medications used to treat hypertension and determine the frequency of potential interactions with one class of medications in a state Medicaid program⁹.

Resistant Hypertension:

Resistant hypertension is defined as failure to achieve goal blood pressure (BP) <140/90 mmHg (or <130/80 mmHg in patients with diabetes mellitus or chronic kidney disease) in patients with hypertension who are compliant with maximum tolerated doses of an appropriate antihypertensive drug regimen consisting of a minimum of 3 agents of different classes, including a diuretic.

Patients who meet the criteria for resistant hypertension but whose BP can be controlled on maximum tolerated doses of ≥ 4 antihypertensive agents are classified as having controlled resistant hypertension. Although the number of failed antihypertensive drugs required for the classification of resistant hypertension is arbitrary, this diagnosis identifies patients at high risk for having a potentially curable (secondary) form of hypertension, as well as those who may benefit from specific therapeutic approaches to lower BP.

The term “resistant hypertension” indicates that the patient has true resistance to otherwise effective antihypertensive treatment and no other causes including improper blood pressure measurement, an inadequately prescribed antihypertensive regimen, failure to adhere to adequately prescribed therapy, or hypertension that is elevated in the office but normal at home (white coat hypertension).

The diagnosis of resistant hypertension implies that the causes of pseudo resistance (lack of BP control with treatment in a patient who does not have resistant hypertension) have been excluded with ambulatory blood pressure monitoring, assessment of adherence to a medical regimen, and other appropriate methods¹⁰.

Hypertension is the leading non communicable disease risk attributing to morbidity and mortality. In India, hypertension is a significant non communicable disease risk attributing to 10% of all deaths. Hypertension attributes to 10% of ischemic heart disease, 21% of peripheral vascular disease, 24% of Acute MI, and 29% of Strokes. The overall prevalence for hypertension in India was estimated to be 29.8%. Appropriate management of hypertension can bring down the incidence of these conditions. With the increasing prevalence of hypertension, there is an increase in the use of antihypertensive drugs, which to a far extent can improve the quality of life and decrease the attributed morbidity and mortality.

Thus, appropriate use of antihypertensive drugs in a society, in an efficient manner is an utmost requirement. Further there is also a requirement for educating the people about hypertension and the consequences of its inadequate management, and also for implementing strategies for prevention as well¹¹.

Blood pressure drugs work in several ways, such as removing excess salt and fluid from the body, slowing the heartbeat or relaxing and widening the blood vessels. A wide range of antihypertensive drugs belonging to different pharmacological classes is available. Choice of drugs for a particular patient changes because of factors such as efficacy, side effects, cost, and development of newer drugs. Hence, it is necessary to survey prescription patterns as a component of medical audit for monitoring, evaluation, and necessary modifications in prescribing practices to achieve rational and cost-effective medical care¹².

Literature Review

1. Supratim Datta (2017)¹³ conducted a study on utilization pattern of antihypertensive in a South Indian tertiary care teaching hospital and adherence to standard treatment guidelines. This study reported that calcium channel blockers were the most frequently used antihypertensive class of drugs (72.3%). Amlodipine (55.6%) was the single most frequently prescribed antihypertensive agent and adherence to the National List of Essential Medicine was 65%. The treatment pattern conformed to standard treatment guidelines.
2. **Renoy Philip et al (2016)** ¹⁴ conducted a study on prescribing patterns of antihypertensive drugs in geriatric population in tertiary care hospital. This study reveals that 53.76% of cases were prescribed with monotherapy was calcium channel blocker and 46.23% by combination therapy was Telmisartan + Hydrochlorothiazide. Among antihypertensive drugs prescribed for treating geriatric patients who were suffering from prehypertension, most of the cases were prescribed with monotherapy followed by combination therapy.
3. **Zahra Eslampanah (2016)** ¹⁵ conducted a study on drug utilization evaluation of anti- hypertensive agents in a medical care hospital. This study reports only 6 major classes were used in the study sample. They were Diuretics (Ds), Calcium Channel Blockers (CCBs), Angiotensin Receptor Blockers (ARBs), Beta Adrenergic Blockers (BABs), Alpha Adrenergic Blockers (AABs) and Angiotensin Converting Enzyme Inhibitors (ACEIs). Diuretics were used the highest in 112 (40.14%) prescriptions and AABs in 7 (2.50%) prescriptions being the least. Evaluation and implementation of effective strategies can greatly aid in improving the quality use of anti-hypertensives.
4. **Madhav D Trivedi et al (2015)** ¹⁶ conducted a pharmacovigilance study of angiotensin-converting enzyme inhibitors given to hypertensive patients. Among 53 ADRs, 24 (4.80%) patients developed dry cough, 8 (1.60%) hypotension, 2 (0.40%) headache, 2 (0.40%) dizziness, 3 (0.60%) nausea/bowel upset, 3 (0.60%) rashes, 2 (0.40%) developed angioedema, 3 (0.60%) dyspepsia, hyperkalemia, acute renal failure, proteinuria are rare. Incidence of ADRs by ACEIs with cough as the most common ADR followed by hypotension.

- Johan P.J et al (2015) 17** have done study on pattern of antihypertensive drug utilization in a tertiary care hospital. The result shows that the current prescribing trend for anti-hypertensive agents and it highlights certain important features in the existing prescribing practice. The pattern of antihypertensive medication in this hospital was rational and the JNC 7 guidelines were followed for treatment of hypertension.
5. **Karthikeyan G.D et al (2015)18** have done study on medication knowledge level of hypertensive patients. The result shows that insufficient knowledge of hypertensive patients about their medication could lead to non-adherence to therapy and low control of their blood pressure.
 6. **Krishna M et al (2015)19** has done study on prescription pattern of anti hypertensive drugs in adherence to JNC-7 guidelines. The study concludes that hypertension is more prevalent in males than in females, with its prevalence increasing with age. Thiazides are the most frequently prescribed classes of drugs alone or in combination. Since the prevalence of hypertension depends upon ethnicity, genetic, environmental and physiological factors, therefore further research is critically needed to set up a rationale choice of medication on the basis of above mentioned factors.
 7. **Nitin K.B et al (2015)20** have done study on adherence to JNC-7 and WHO-ISH guidelines of antihypertensive medications prescribed to hypertensive patients with co- morbid conditions. The study demonstrated that physicians are not completely adhering to standard guidelines while treating hypertension with co morbid conditions. It is evident that prescribing guidelines should be followed for better health outcome and improvement in quality of life of patients suffering from hypertension with co- morbidities.
 8. **Pyarelal et al (2015)21** done a study of prescription pattern of antihypertensive drugs in tertiary care teaching hospital. The result shows hypertensive is more prevalent in male patients than female patients. ARBs and CCBs were the most common single drugs used for most of the uncomplicated essential hypertension followed by ACE inhibitors.
Rama M.P et al (2015)22 have done study on drug utilization patterns of antihypertensive medication in a tertiary care hospital. Majority of drugs were prescribed by brand names on an average two drugs per prescription. CCBs were the most commonly used drugs to treat hypertension among all the age group patient population followed beta blockers, ARB, ACEI, diuretics, clonidine and prazosin. It was also found that there was less number of fixed dose combinations was prescribed The study suggests that there is immense scope of improvement in prescribing practices in the form of rational drug prescribing for achieving optimal blood pressure control.
 9. **Vishal R et al (2015)23** have done study on antihypertensive drug prescription patterns, rationality and adherence result shows that in the monotherapy, category angiotensin receptors blockers (ARBs) accounted (24.8%), calcium channel blockers (CCBs) (19.4%), angiotensin converting enzyme inhibitors (ACEIs) (11%), beta blockers (BBs) (2.8%), and diuretics (2%) of the total prescription.
 10. **Anand R.K et al (2014) 24** has done study on a prospective study of prescribing pattern of antihypertensive drugs in tertiary care hospital. The most frequently prescribed antihypertensive drugs were ARBs (58%), CCBs (50%), beta blockers (15%), diuretics (14%). 68% received monotherapy while remaining 32% received combination therapy. The prescription pattern was found to be partly in accordance with JNC 7 guidelines.
 11. **Geetha M et al (2014)25** conducted a study on drug utilization pattern of antihypertensive drugs among chronic kidney disease patients in a tertiary care hospital. The result shows that combination of diuretic and calcium channel blocker (80%) was commonly used in hypertensive patients with diabetic. Beta blocker because of its known adverse effects in diabetic patients (hypoglycaemic unawareness) is getting less commonly used than in non diabetic. Use of antihypertensive drugs such as selective beta blocker, alpha-blocker, calcium channel blocker combination (45%) more commonly used in non diabetic with hypertension.
 12. **Mirza A.B et al (2014)26** done a study on prescribing pattern among hypertensive patients. The result shows a total of 1828 drugs were prescribed and the most commonly prescribed drugs were ARBs and ACE inhibitors. Rational prescribing requires consideration to dose, duration and interaction with other medications.
Pavitra R.Y et al (2014)27 conducted a study on drug utilization pattern of antihypertensive drugs in chronic kidney disease patients in a tertiary care hospital. This study reports the combination of diuretic and calcium channel blocker (80%) was commonly used in hypertensive patients with diabetes. Uses of antihypertensive drugs such as selective beta blocker, alpha blocker, calcium channel blocker combination (45%) were more commonly used in nondiabetic with hypertension.
 13. **Anand K et al (2013)28** has done study on prescribing patterns of antihypertensive drugs in tertiary care hospital. The current prescribing trend for antihypertensive agents. It implies that calcium channel blockers are the leading group of antihypertensive agents followed by diuretics. The treatment of hypertension keeps changing and newer drugs are being added at a rapid pace. Further studies focused on the rationale for choice of drugs based on demographic data, economic status, associated conditions and complications would give additional insights into prescribing patterns in hypertension in India.
 14. **Rubiya S et al (2013)29** have done study on drug use evaluation of antihypertensive medications in out patients in a secondary care hospital. The study indicates the necessity of preventive care for hypertension. Improving patient's knowledge on antihypertensive medications on all aspects will boost up the present health care in this setting.
 15. **Ushadevi K.H et al (2013)30** have done study on drug use evaluation of antihypertensive medications in out patients in a secondary care hospital. The prevalence of monotherapy is higher than combination therapy. Most frequently prescribed monotherapy is calcium channel blockers and ACE inhibitors.
 16. **Jainaf Nachiya et al (2013)31** conducted a study on drug utilization pattern of antihypertensive medications on out-patients and inpatients in

a tertiary care teaching hospital. This study reports, ACE inhibitors were most frequently prescribed antihypertensive drugs (41.84%) and 24.0% beta blockers, 17.7% calcium channel blockers, 11.4% diuretics, 1.5% angiotensin II receptor antagonist were the other antihypertensives prescribed. ACE inhibitors were most frequently prescribed and amlodipine was highest consumed drug in the internal ward.

Seema G et al (2012)³² conducted study on prescribing pattern of antihypertensive drugs in a tertiary care hospital. Majority of patients studied had stage 1 hypertension (37.2%), type 2 diabetes mellitus was the most common co morbidity observed in the patients (40%). Commonly prescribed antihypertensive group of drugs in decreasing order of frequency were; ACE inhibitors and CCBs followed by beta-blockers, ARBs and diuretics.

17. **Khawaja T.M et al (2011)**³³ conducted study on rational use of beta blockers in management of hypertension. The result shows that the frequency of different beta blocker varies; Atenolol 48%, Propranolol 34% and Metoprolol 18% were prescribed. Beta blockers are very effective in controlling blood pressure in hypertensive patients. Beta blockers are mostly used as first line antihypertensive therapy.
18. **Salaman M.S et al (2010)**³⁴ have done study on management of hypertension in the end stage renal disease patient. The result shows that blood pressure control is not adequate in a vast majority of haemodialysis patients, which in turn translates into an elevated rate of cardiovascular disease.

Objective

1. To assess the drug utilization pattern of antihypertensives in the prescription.
2. To identify the risk factors of hypertension.
3. To identify the drug interactions in the prescriptions.

Conclusion

Through the current study, we could assess the drug utilization pattern of antihypertensive in general medicine department. This study has provided an insight into the prescription patterns of antihypertensive medications with respect to the level of BP control. It will help prescribers to pay more attention for specific factors that affect outcome of BP.

Studies from every now and then are required in drug utilization pattern and standard treatment guidelines to be circulated among prescribing clinicians. There is need of creating awareness about current management of hypertension to clinicians by organizing various workshops. Therefore educational strategies must be carried out to focus on utilisation of antihypertensive medications and overcoming individual risk factor. Also raising patient trust in their physicians may improve patient motivation to take prescribed medication.

The trend of hypertension is on the rise, if treated rationally this disease can be overcome. Patients too need to express their interest to know more about the drugs they have been prescribed, and this can promote a safe knowledge on their illness and special care, which would improve their quality of life.

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