Original Article

A REVIEW ON DRUG UTILIZATION STUDY OF HYPERTENSIVE DRUGS IN OUTPATIENT IN THE DEPARTMENT OF GENERAL MEDICINE OF TERTIARY CARE HOSPITAL

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Abstract

A hypertensive emergency or a hypertensive urgency (blood pressure more than 180/120 mm Hg) may be present during a hypertensive crisis (severe blood pressure elevation without acute or progressing target organ injury). Hypertension is a substantial risk factor for both cardiovascular disease and stroke. Effective hypertension treatment considerably reduces these issues. Through the current study, we were able to evaluate the general medicine department's antihypertensive drug usage pattern. According to the study report, there were more men than women in the population. The most common diagnosis in the general medicine department was diabetes mellitus. In the study, beta blockers and calcium channel blockers were the two most commonly used medications. Amlodipine and atenolol were the most often used calcium channel blockers and beta blockers in the general medicine department, respectively. The main medication interactions that were evaluated in this investigation were found to be highly significant. Formulating a common therapeutic plan is aided by identifying and keeping track of drug interactions. It has given insight into the antihypertensive prescription trends concerning the degree of blood pressure management. It will enable prescribers to focus more on factors that influence BP results. Studies on drug usage (DU) and prudent drug prescribing are crucial for achieving this. To promote rational prescribing, DU research and prescription monitoring help to identify relevant problems, give the practitioner helpful feedback, and improve awareness of illogical prescribing.

INTRODUCTION

Drug utilization research's main goal is to encourage communities to take medications responsibly. The rational use of a drug for a specific patient entails the recommendation of a well-researched medication at the ideal dosage, along with the appropriate information, at a reasonable cost.

Drug utilization research also sheds light on the efficacy of pharmacological use, i.e., if a particular drug therapy is cost-effective, and its findings can be utilized to assist define priorities for the sane distribution of healthcare funds[1].

When hypertension is confirmed as a diagnosis, adequate blood pressure control is required. This can be accomplished by prescribing potent antihypertensive medications, regular blood pressure checks, and follow-up visits to reduce morbidity[2].

Although there are several risk factors for cardiovascular and cerebrovascular disorders, hypertension is by far the biggest risk factor, affecting more than 1 billion people globally. The cause of roughly 7.1 million fatalities annually is hypertension[3,4].

The incidence of hypertension rises as people age[3]. Raised arterial pressure is linked to pathological changes in the vascular system and left ventricular hypertrophy. As a result, hypertension is a major risk factor for myocardial infarction, sudden cardiac death, and coronary artery disease, as well as the primary cause of stroke. Aortic dissection aneurysm, renal insufficiency, and heart failure are also all significantly impacted by it.

Hypertension is a major risk factor for brain hemorrhage and infarction. The majority of strokes nearly 85% are caused by infarction, with the remaining strokes being caused by bleeding, either intracranial or subarachnoid. Systolic blood pressure levels that are elevated are linked to a steadily rising risk of stroke, especially in people over 65. [5]

Signs and symptoms

According to the American Heart Association, the primary hypertension patient may typically have no symptoms or may have significant risk factors for cardiovascular disease.

Cardiovascular risk factors include things like age, gender, heredity, smoking, elevated lipid profiles, obesity and overweight, and diabetes mellitus.

Two or more historically high blood pressure readings in adult patients on average[6].

Types of hypertension

Primary or essential hypertension and secondary hypertension are the two types of hypertension that can

occur[7]. **PRIMARY HYPERTENSION**

When the precise reason is unknown, essential hypertension is also known as primary or idiopathic instances. Nearly 85% of people with hypertension have essential hypertension[8].

SECONDARY HYPERTENSION

Secondary hypertension is brought on by underlying causes such as renal conditions like apnea, endocrine disorders, pregnancy, smoking, stress, and long-term alcohol usage, among others[9]. Medical professionals use a variety of terms to describe increased blood pressure, such as malignant, transitory, or labile hypertension.[10]

Malignant hypertension is characterized by an unanticipated rise in diastolic blood pressure above 125 mmHg, which can harm the kidneys, heart, brain, and eyes.[11]

A temporary increase in blood pressure caused by an emotional response and stressful circumstances in a therapeutic setting is known as transient or labile hypertension. White coat hypertension is a typical illustration.[12]

Only the systolic blood pressure increases in isolated systolic hypertension, a condition that typically affects older adults. By the time a person is 55 years old, their diastolic blood pressure has decreased but their systolic blood pressure has increased.[13]

Patients with resistant hypertension require a commitment to non-pharmacological interventions like exercise and lifestyle changes in addition to drug treatment because conventional treatments and therapies become ineffective at controlling blood pressure. Along with medicine, reduced sodium diets and exercise are recommended for people with resistant hypertension.[14]

Classification of antihypertensive drugs

Beta-blockers

The pharmacological heterogeneity of the beta-blocker class, along with its partial agonist action and accompanying vasodilating effects, determines its pharmacodynamic features. According to their pharmacological qualities, they all reduce blood pressure to the same degree while employing varying degrees of cardiac output decrease and vasodilation.[15]

Diuretics

Natriuresis and diuresis are increased by loop diuretics and thiazide diuretics [11]. Despite coming from two different pharmacological classes, both might be regarded as a single, important therapeutic class of antihypertensive medications. There are distinct descriptions of their primary methods of action and negative consequences. Another therapeutic class is potassium-sparing diuretics.

Angiotensin-converting enzyme inhibitors

Early in the 1980s, captopril became the first ACEI accessible for the treatment of hypertension. Enalapril, perindopril, lisinopril, ramipril, quinapril, benazepril, cilazapril, trandolapril, fosinopril, moexipril, imidapril, and zofenopril quickly followed.

Angiotensin II receptor blockers

Losartan was the first angiotensin II receptor blocker (ARB) to be made accessible for the treatment of hypertension in the late 1990s. Candesartan, eprosartan, irbesartan, valsartan, telmisartan, and olmesartan quickly followed.

Calcium-channel blockers

The class of medications known as calcium-channel blockers (CCBs) is heterogeneous and includes benzothiazepine verapamil, phenylethylamine diltiazem, and dihydropyridines (DHPs), including nifedipine and amlodipine.

Renin inhibitor

Aliskiren, a non-peptide and orally active medication, is the only direct renin inhibitor currently available for treating hypertension patients. Human renin is inhibited by the extremely effective and selective agent aliskiren. Compared to the responses to ACEIs and ARBs, the increase in plasma renin concentration seen following aliskiren administration is greater. However, because of the reactive, the rise in plasma renin content does not cause a paradoxical rise in blood pressure.

Guidelines for the treatment of hypertension

According to the 2013 Eight Joint National Committee (JNC 8) guidelines for managing hypertension, blood pressure should be kept below 150/90 mmHg in those over 60 who do not have diabetes mellitus or chronic renal disease, and below 140/90 mmHg in those who do [16]. According to the minority opinion from JNC 8, persons over the age of 80 who have hypertension but neither DM nor CKD should aim for a blood pressure of less than 140/90 mmHg [17]. The 2013 update of the UK National Institute of Health and Care Excellence (NICE) hypertension guideline advised decreasing blood pressure to less than 140/90 mmHg in people under the age of 80 [18]. These recommendations advised decreasing blood pressure in those under the age of 80 to 150/90 mmHg [18].

Three recommendations are made in the 2017 American College of Physicians (ACP)/American Academy of Family Physicians (AAFP) hypertension guidelines.

1) Systolic blood pressure should be decreased to below 150 mmHg in adults aged 60 and older to lower the risk of death, stroke, and cardiovascular events.

2) To lower the risk of recurrent stroke, adults over the age of 60 with a history of stroke or transient ischemic attack should have their systolic blood pressure reduced to less than 140 mmHg.

3) To lower their risk of stroke and cardiovascular events, those over the age of 60 with high cardiovascular risk should have their target systolic blood pressure reduced to less than 140 mmHg.

MANAGEMENT GOALS

Most adults with hypertension should have blood pressure (BP) goals of fewer than 130/80 mmHg; those 65 years of age and older who are non-institutionalized, living in the community, and ambulatory may be treated to a systolic BP goal of less than 130 mmHg [19].

1. Adults with clinical cardiovascular disease (CVD) or a 10-year atherosclerotic CVD (ASCVD) risk of 10% or higher, adults without clinical CVD and a 10-year ASCVD risk of less than 10%, adults with diabetes mellitus, chronic kidney disease (CKD), CKD after renal transplantation, heart failure, stable ischemic heart disease, secondary stroke prevention, and peripheral arterial disease should aim for a blood pressure goal of less than 130/80 mmHg.
2. To maintain long-term maternal health and lessen delayed foetal growth, consider a target systolic BP aim of 110 to 129 mmHg and diastolic BP of 65 to 79 mmHg for pregnant patients with diabetes and chronic hypertension. Angiotensin receptor blockers and ACE inhibitors are not advised during pregnancy [20].
3. Systolic and diastolic blood pressure should be reduced in paediatric patients to less than 90th percentile levels, and in teenagers 13 years of age and older, to less than 130/80 mmHg [21].

DRUG UTILIZATION STUDY

In clinical practise, drug utilisation research is essential because it serves as the foundation for changes to local and federal prescription dispensing regulations. Such studies ultimately aim to promote sensible drug use. Additionally, it is crucial in developing nations like India, where individuals bear 72% of the cost of healthcare[22], as it aids in the development of ways to use health resources as effectively as possible.

Inpatient medication use research studies are useful tools for assessing the effectiveness and cost-effectiveness of hospital formularies as well as trends in prescription prescribing. Drug use varies constantly between nations, even within the same nation's health institutions, and even even within the same institute at different points in time [23]. This variety is likely caused by the fact that illness trends change over time.

Drug utilisation (DU) is the marketing, distribution, prescribing, and use of drugs in a society with a focus on the social and medical effects that emerge from this use. [24] Given the limited resources that developing nations have available and/or allocated for healthcare, judicious drug prescribing is crucial. Therefore, rational drug prescription becomes crucial in developing nations in order to make the most use of the budgetary resources. [25]

HOW DUR PROMOTE RATIONALE DRUG USE

Drug utilisation research ensures that pharmaceuticals are available to each patient in an ideal dose for the proper indication with accurate information and at a reasonable cost by promoting rational drug usage. Knowing how medications are prescribed and used is crucial for promoting responsible drug use because it allows us to start a dialogue and provide solutions to alter prescribing practises. [26] A study on drug use accomplishes this in three different ways.

1. An explanation of drug consumption trends

2. Incipient indications of unreasonable drug usage

3. Drug usage improvement measures. [27]

DRUG USE INFORMATION

Depending on the issue under investigation, various sorts of drug use data are required. These comprise details regarding the general usage of drugs, drug classes, particular generic chemicals, or particular products. The condition being treated, the patient's demographics, and the prescriber are frequently also needed. Data on drug expenditures will also be crucial for ensuring that medicines are utilised effectively and affordably. The judicious use of pharmaceuticals can be encouraged by using this kind of drug information. [28]

DIFFERENT METHODS TO APPROACH DUR

THERE ARE 3 APPROACHES TO DUR

1. PROSPECTIVE
2. CONCURRENT
3. RETROSPECTIVE

1. PROSPECTIVE

In order to find drug-related issues like therapeutic duplication, drug-drug interactions (DDIs), drug-disease contraindications (when disease information is available or using surrogate indicators), or other potential adverse drug events, prospective DUR involves reviewing each prescription for a specific patient before it is dispensed. [29,30]

2. CONCURRENT

Reviewing medication orders concurrently with therapy is known as concurrent DUR. When drug therapy changes may be required as a result of ongoing diagnostic and laboratory procedures, this form of review is ideal. [29,30]

3. RETROSPECTIVE

Retrospective DUR is carried out following the dispensing of the prescriptions and uses practise pattern analysis to identify the use of high-cost drugs, to compare particular classes of drug use by different facilities or providers, or to monitor adherence to pharmacotherapy recommendations from practise pattern guidelines for the treatment of particular diseases[29,30].

CONCLUSION

The sensible use of a drug for a specific patient is the recommendation of a thoroughly researched medication at the ideal dosage, along with the required information, at a reasonable price. Research on drug usage also sheds light on the efficacy of therapeutic therapies. The American Heart Association claims that the 2013 version of the UK National Institute of Health and Care Excellence hypertension guideline advised decreasing blood pressure to less than 140/90 mmHg in anyone under the age of 80. Systolic blood pressure should be less than 150 mmHg in adults 60 years of age and older to lower the risk of death, stroke, and cardiovascular events. Systolic blood pressure should be lowered to less than 140 mmHg in adults over 60 who have experienced a stroke or transient ischemic attack in order to reduce the risk of subsequent strokes. This study shows that every prescription was rational, but there is definitely room for improvement in the way antihypertensive drugs are provided to persons with high blood pressure. Adverse drug responses (ADRs) must be reported by patients, who must also offer the proper counselling to enhance quality of life.

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