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RESEARCH ARTICLE

An Observational Overview Regarding ADRs of Antihypertensive Drugs Used in Tertiary Care Hospitals

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ABSTRACT

Introduction: The analysis and control of antihypertensive drugs concerning ADRs were studied in tertiary care hospitals. It helps determine a drug's safety, efficacy, and appropriateness. The monitoring of adverse drug reactions (ADRs) involves tracking their occurrence and classifying them as types A to F. Two systems that support ADR reporting are EudraVigilance and MedWatch.

Materials and methods: Involving 131 patients this study examined the use of antihypertensive medications in treating hypertension as well as the monitoring of adverse drug reactions (ADRs). Patient profiles and physician records were two of the data sources. The study was conducted through a questionnaire-based Google Form and an informed consent document.

Result and discussion: 68.8% males are affected which is far more as compared to females which are 31.2% from hypertension disease. 71.9% of the patients were on mono therapy as compared to double and multiple therapy for the treatment of hypertension disease. And 90.6% patients consume tablets as a dosage form which makes it the preferred choice among the patients.

Conclusion: The results revealed a preference for allopathic medications, monotherapy over combination therapies, and the use of calcium channel blockers (Amlodipine) and ARB blockers (Losartan, Telmisartan).The ADR registered for ARB blockers (Losartan, Telmisartan) are UTI Infection, Dyspnoea, Dyspepsia, fainting and reduction in kidney output.

Keywords: Antihypertensive drugs, Survey, Adverse Drug Reaction, Safety.

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INTRODUCTION

A Drug Utilization Study (DUS) analyzes prescription, distribution, and consumption patterns of drugs within a population. Its primary objectives include assessing prescribing practices, ensuring the proper use of medications, monitoring patient compliance, examining healthcare expenses and outcomes, and researching drug safety, particularly in relation to adverse reactions and misuse. Cross-sectional studies, longitudinal studies, and prescription database analysis can all be used to carry out DUS, helping healthcare practitioners and policymakers make informed choices about patient safety and drug regulations [1-3].

The monitoring of Adverse Drug Reactions (ADRs) covers everything from mild to serious negative drug effects. It is essential to pharmacovigilance, which helps maintain drug safety and effectiveness [3-8].

ADRs are divided into several types: Type A (predictable), Type B (allergic or unpredictable), Type C (chronic), Type D (delayed), Type E (end-of-treatment), and Type F (failure). Spontaneous reporting, active surveillance, signal detection, and epidemiological studies are all part of the monitoring process [3,5,8,9].

Regulatory bodies like the FDA and WHO supervise ADR reporting systems, and ADR monitoring can result in changes to drug labels or perhaps market withdrawal [2,4,8].

Antihypertensive medications treat high blood pressure, a significant risk factor for cardiovascular disease.[7,9]. These medications operate through different mechanisms, such as enhancing heart function, dilating blood vessels, and decreasing blood volume. They include diuretics, ACE inhibitors, ARBs, calcium channel blockers, beta-blockers, alpha-blockers, renin inhibitors, central alpha agonists, vasodilators, and combined blockers [6,7,9].

Hypotension, electrolyte imbalances, dyspnoea, dyspepsia, dry cough, peripheral edema, bradycardia, and weariness are examples of ADRs associated with antihypertensives. The significance of monitoring patient reactions is emphasized by the unique side effects associated with each drug class [5,6,7,10].

MATERIAL AND METHODS

The study was a prospective drug utilization analysis conducted online and at Yatharth Hospital in Greater Noida. It evaluated over 131 questionnaire forms.

Patients included in the survey were those using anti-hypertensive drugs who visited the hospital, consenting to participate. Only those already on medication were considered. Exclusions were made for patients not on anti-hypertensive drugs, mentally impaired individuals, drug addicts, and specific groups like pregnant women and neonates. Data was sourced from physician records and patient profiles, using a questionnaire-based Google form and an informed consent form.

RESULTS AND DISCUSSION

Age factor vs percentage response on hypertensive disease

The online survey of the patient suffering from hypertensive disease was done and different responses of patient were collected through online survey and hospital visit. Various parameter was taken into consideration. From the 84-response recorded via survey based on the questionnaire response, hypertensive disease occurs at any age mostly. Minimum percentage response was shown in the age group ranging from 12-25 years. Result are expressed below in tabular form (Table 1) and pie chart (Figure 1) also.

Treatment therapy including Allopathic vs Hhomeopathy vs Ayurveda

The other parameters which was taken into consideration was the type of drug used in hypertension patients. The no. of people depending on the allopathic treatment is more as compared to homeopathy and ayurveda according to the survey. Patient using allopathic drugs were 81% and homeopathy are 18.8% and that of ayurveda are 9.4%. Result is shown in Table 2 and Figure 2

Table 1: Representing age of patient and percentage response

S.N.	*Age (years)*	*Responses (percentage)*
1	12-25	58.8 %
2	25-40	12.9 %
3	More than 40	24.6 %
4	At any age	3.7 %

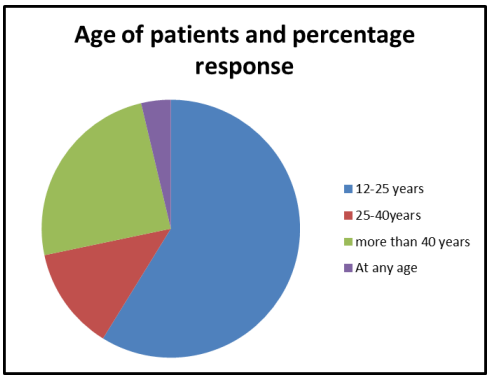

Figure. 1: Pie chart depicting age of patient vs percentage response

Table 2: Depicting type of drug used and percentage response

S.N.	*Type of drugs*	*Response (in percent)*
1	Allopathic	76.5%
2	Homeopathic	15.2%
3	Ayurvedic	8.3%

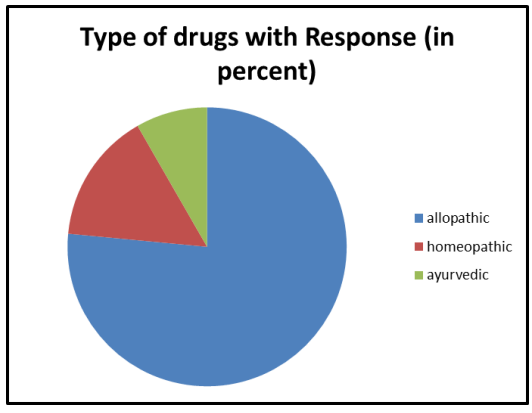

Figure 2: Pie chart representing the types of drug used for hypertension disease

Table 3: Table depicting gender and percentage of response

S.No	*Gender*	*Response (in percent)*
1	Males	68.8%
2	Females	31.2%

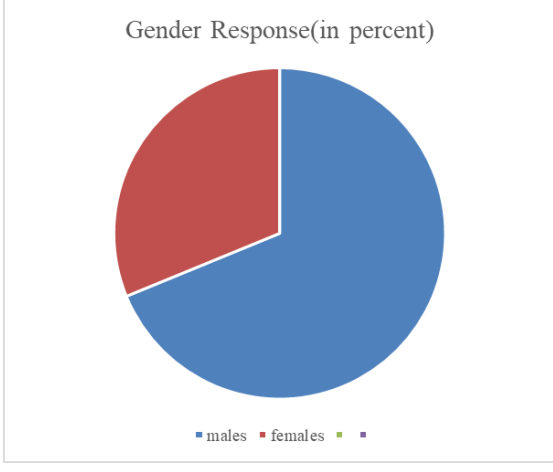

Figure 3: Pie chart representing gender vs percentage response

Gender based response

On the basis of online survey and hospital visit, it was observed that males are more affected by hypertension disease as compared to female candidates. The percentage

Table 4: Time duration of hypertension disease and percentage response

S.N.	Time Duration	Response(in percent)
1	Duration not prescribed	40.6%
2	5 days	18.8%
3	10-15 days	9.4%
4	20-30 days	3.1%
5	30-50 days	12.5%
6	Never	3.1%
7	60-90 days	3.1%
8	Depending on patient	3.1%
9	90 days	3.1%
10	Life long	3.2%

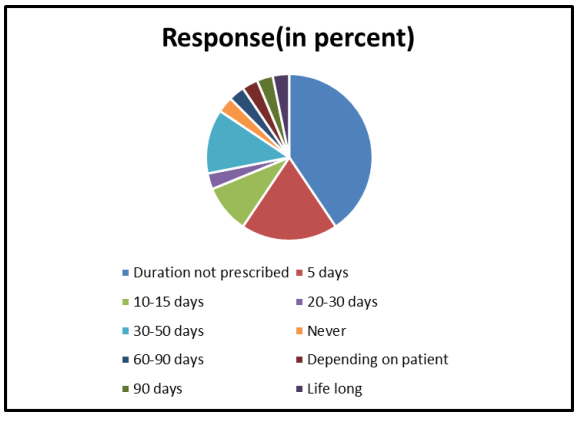

Figure 4: Duration of hypertension disease

of males affected is 68.8% which is far more as compared to females which are 31.2%. Result are expressed below in tabular form (Table 3) and pie chart (Figure 3) also.

Time duration

Onset of the hypertension disease depends on the type of treatment used basically. As per the survey, many peoples are not informed about the duration of the treatment. The percentageresponseare expressed below in tabular form (Table 4) and pie chart (Figure 4) also.

Anti hypertension drugs prescribed in other diseases

According to the survey, following are the disease in which anti-hypertensive drugs are prescribed namely heart failure, chronic kidney disease, diabetic nephropathy, ischemic heart disease and chronic heart failure. (Table 5)

Types of therapy

Online survey was done to reveal that patient suffering from hypertension disease were mostly on mono therapy as compared to double and multiple therapy. 71.9% of the patient were on mono therapy while only 15.6% were using multiple therapy and others 12.5% were using

Table 5: Anti-hypertensive drugs used in other diseases

S.No.	Diseases
1	Heart Failure
2	Hypertension
3	Chronic kidney disease
4	Diabetic Nephropathy
5	Ischemic heart disease
6	Chronic heart failure

Table 6: Depicting types of therapy and percentage of patient using it

S.N.	Type of Therapy	Response
1.	Mono therapy	71.9%
2.	Double therapy	12.5%
3.	Multiple therapy	15.6%

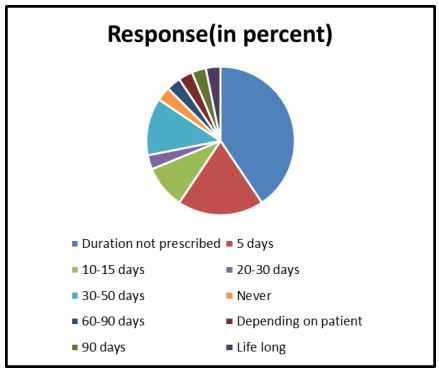

Figure 5: Pie chart representing types of therapy and percentage response

Table 7: Dosage form of drug used for the treatment of hypertension disease vs percentage of people consuming it

S.N.	Types of drug forms	Percentage response
1	Tablets	90.6%
2	Injection	9.4%
3	Others	15.6%

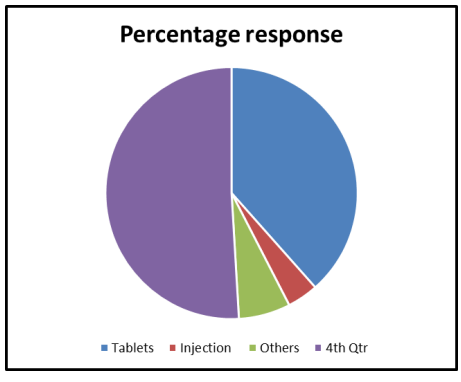

Figure 6: Pie chart represents types of drug form and percentage response

double therapy for hypertension treatment. Result are expressed below in tabular form (Table 6) and pie chart (Figure 5) also.

Table 8: Drug category used in treatment of hypertension disease vs percentage of people consuming

S.NO	Drug category	Percentage response	Example
1	Diuretics	17.2%	Furosemide
2	Beta blockers	20.7%	Atenolol, propanolol
3	ACE inhibitors	13.8%	Captopril, Enalapril
4	Alpha blockers	0%	-
5	Calcium channel blockers	20.7%	Amlodipine
6	ARB blockers	24.1%	Losartan, Telmisartan
7	No Drug used	3.4%	-

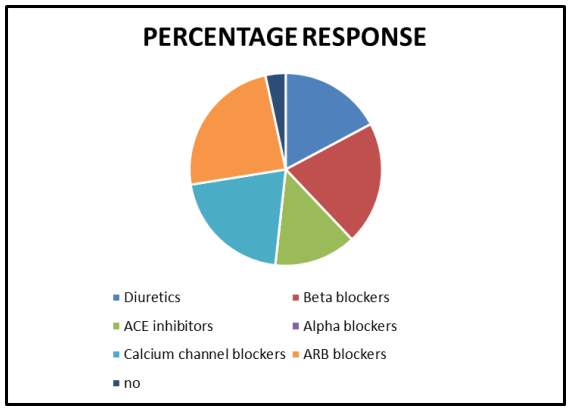

Figure 7: Pie chart represents drug category used in disease and percentage response

Dosage form of drugs used

Online survey was conducted to reveal that mostly peoples depend on tablets for the treatment of hypertension disease (Table 7). 90.6% peoples consume tablet for the treatment of hypertension disease then some take injection around 9.4% to get rid of the hypertension and some takes other things around 15.6% to treat the hypertension. Result are expressed below in tabular form (Table 7) and pie chart (Figure 6) also..

Drugs Used in the Treatment

Online survey was done to reveal that patient suffering from hypertension disease took the ARB blocker (Losartan, Telmisartan) most commonly around 24.1% and ACE inhibitors 13.8%. Diuretics 17.2% and calcium channel blockers 20.7% were used in the treatment of hypertension disease. Result are expressed below in tabular form (Table 8) and pie chart (Figure 7) also.

ADR of antihypertensive drugs

Antihypertensive drugs can cause a variety of adverse drug reactions (ADRs), with common examples including hypotension, dizziness, dry cough, edema and electrolyte imbalances (Table 9). The severity of ADRs can range from mild and manageable to severe and life threatening, potentially impacting adherence to medication and requiring adjustments to treatment plans.

Table 9: Various drugs category and their ADRs

S.N	Drug category	Adverse drug reaction
1	Diuretics	Dehydration and electrolyte imbalance, vomiting
2	Beta blockers	Fatigue, dizziness, nausea
3	ACE inhibitors	dry cough and dizziness, headache
4	Alpha blockers	Orthostatic hypotension and nasal congestion
5	Calcium channel blockers	Swelling in feet and lower leg
6	ARB blockers	Vomiting, UTI, dyspnea, dyspepsia, fainting

CONCLUSION

According to the survey, it was determined that hypertension can develop at any age. The treatment of hypertension is more commonly with allopathic medications than with homeopathic or Ayurvedic remedies. The actual duration of treatment is not prescribed by the prescriber, although it may vary based on a variety of factors, including age, kind of therapy, and nature of the medicines. Antihypertensive medications are used to treat a variety of conditions, including chronic kidney disease, diabetic nephropathy, ischemic heart disease, and chronic heart failure.

For the treatment of hypertension, a greater percentage of patients prefer mono therapy (71.9%) over double therapy (12.5%) and multiple therapy (15.6%). 90.6% of patients utilize solid tablet dosage forms, 9.4% use injectable dosage forms, and 15.6% use other dosage forms. The most frequently prescribed medications for the treatment of hypertension are losartan and telmisartan (ARB blockers). 24.1% of patients used ARB blockers, 20.7% of patients used amlodipine (calcium channel blockers), and approximately 20.7% of patients used atenolol and propranolol (beta blockers). Other medications, such as furosemide, which was used to treat hypertensive disorders, were also employed. The ADR registered for ARB blockers (Losartan, Telmisartan) are UTI Infection, Dyspnea, Dyspepsia and Reduction in kidney output.

FUTURE PROSPECTIVE

This study highlights the vital role that medication counseling, adverse drug reaction (ADR) reporting,

and continuous patient monitoring play in improving the management of hypertension from the standpoint of a clinical pharmacist. By encouraging adherence to monotherapy where necessary, assuring reasonable drug usage, and spotting any drug-related issues—particularly with routinely used medicines like ARBs—clinical pharmacists can play an active role in the future. Pharmacists can also take the lead in patient education programs, early ADR detection (such renal impairment, dyspnea, or UTI), and tailored medication modifications, all of which can improve patient safety and therapeutic results in the treatment of hypertension.

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