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PROSPECTIVE STUDY ON COST MINIMISATION OF ANTI HYPERTENSIVE DRUGS IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Hypertension, persistent increase in systolic and diastolic blood pressure is one of the diseases that has severe impact on body and economy. Pharmacoeconomic evaluations can be applied to review the value of treatments, compare the medical cost and health outcomes associated with new medicines to the price. Main aim and objective of our study was to find out the prescribing patterns of antihypertensives along with the pharmacoeconomic analysis of anti-hypertensive drug. **Materials and Methods:** A prospective observational study was conducted at a tertiary care hospital in Dakshina Kannada for period of 6 months. 150 hypertensive patients who were on at least one antihypertensive medication, admitted to in-patient department were included for pharmacoeconomic analysis during the study period. **Results:** According to the study, 54% of hypertensive subjects were above 60- 75 years of age. 86% of prescription had more than 6 drugs. Majority of total direct cost was attributed to medication and medical cost (44%). On cost comparison of generic, Jan Aushadhi and branded drugs, generic and Jan Aushadhi drugs are comparatively less expensive; providing the same efficacy as branded drugs. Prescribing Jan Aushadhi and generic drugs will lead to reduction in total medical cost thus reducing the economic burden which will indirectly lead to increase in adherence of patients to the therapy. **Conclusion:** Among direct expenses, medication cost was a major contributor for healthcare expenditures in hypertension. Cost minimization method includes comparison among different generic medications which suggested that Jan Aushadhi drugs were

comparatively cheaper. Treatment becomes the major hurdle hence decreasing the cost of therapy will enhance the health outcome.

KEYWORDS: Antihypertensive drugs; Pharmacoeconomic analysis; Jan Aushadhi; Generic Drugs.

INTRODUCTION

Systemic hypertension is a worldwide general health problem influencing presently more than one billion of the world's population with an alarming protrusion to 1.56 billion by year 2025.[1] Hypertension, also known as high or raised blood pressure, is a condition in which the blood vessels have persistently raised pressure. It is the paramount risk factor for cardiovascular morbidity and mortality due to target organ damage to blood vessels of the heart, brain, kidney, and eyes.[2] The WHO has gauged that high blood pressure is a crucial public health issue and lead to one in eight death.[3] Pharmacoeconomics is the analysis and evaluation of outcomes (clinical, economic, or humanistic), cost consequences, and cost comparison. Pharmacoeconomic evaluations can be applied to estimate the value of treatments, to compare the medical cost and health outcomes associated with new therapies/medicines and to determine the outcome of the existing alternative treatment.

One of the approaches to aid rational drug use is the appraisal of drug prescribing patterns based on drug use indicators. Rational drug prescribing is the use of the minimum number of drugs to obtain the best possible effect in the shortest period at a reasonable cost.[4] However, recently published evidence indicated an increase in use of Calcium Channel Blockers (CCBs) and Angiotensin Converting Enzyme Inhibitors (ACEIs) are noted compared to diuretics and beta blockers in lowering morbidity and mortality of cardiovascular diseases.[5]

Medicines add up to a substantial proportion of out-of-pocket (OOP) expenses in Indian households. In order to deal with this issue, the Government of India launched the Jan Aushadhi (Medicine for the Masses) Scheme (JAS) to provide cost friendly generic medicines to the patients.[6]

Objectives

To analyse the cost minimization of oral antihypertensive brand drugs vs different generic drugs.

MATERIALS AND METHODS

Study design: A prospective observational study to evaluate drug utilisation among hypertensive patients.

Study site: The study was conducted at Srinivas Institute of Medical Science and Research Centre, Mukka-574146

Study duration: The study was conducted for aduration of 6 months from March 2022 – August 2022.

Sample size: The sample taken for the study was 150.

Ethical clearance: The study protocol was approved by the Institutional Ethics Committee (IEC) of Srinivas Institute of Medical Science, Mukka, Mangaluru.

Study criteria

Inclusion criteria

- Hypertensive patients
- Patients above 18 years of age
- Patient with comorbid conditions: Stroke, CKD, DM, Hyperlipidemia, CHF and others
- Patient on at least one oral antihypertensive drug

Exclusion criteria

- Out-patients
- Patients below 18 years of age

Source of data

Data(s) for the study were collected using data collection form from the in-patient case files.

Study method

Data(s) were collected using data collection form with the aid of medical records of in-patients in a tertiary care hospital, Mangaluru. Data collected include patient name, gender, age, diagnosis and drugs prescribed.The obtained results after the application of suitable tools were analysed in Microsoft excel and all the data(s) were kept confidential.

Statistical analysis

Statistical analysis involves collecting and scrutinizing of every data sample in a set of items from which samples were drawn and a suitable statistic method was applied to analyse the data. The collected data(s) were analysed using Microsoft excel.

RESULTS

Jan Aushadhi antihypertensive drug cost were low compared to brand drugs and counter generic composition even though both had same efficacy. Among oral antihypertensive drug class Diuretics particularly Furosemide 40mg [₹ 6.90/30tab] was least expensive. Followed by Beta blockers, Atenolol 50mg [₹ 12.85/30tab], Calcium channel blocker, Amlodipine 5mg and Angiotensin converting enzyme inhibitor, Enalapril 5mg both were ₹ 15.00/30tab. Beta blockers, Propranolol 40mg and Metoprolol 25mg both costed ₹ 18.00/30 tab. The most expensive Jan Aushadhi oral antihypertensive drug was Centrally acting sympatholytics Moxinidine 0.3 mg tablet [₹ 141.00/30 tab], as shown in Table 6.

Calcium channel blockers

Among calcium channel blockers Amlodipine 5mg was the least in cost i.e.; ₹15.00/30 tablets, followed by Amlodipine 2.5mg [₹22.95/ 30tab], Nifedipine 20mg [₹24/ 30tab], Diltiazem 30mg [₹ 33.00/30 tab], Verapamil 80mg [₹42/30 tab] and Cilnidipine 10mg [₹ 45.00/30 tab]. Percentage benefit of Jan Aushadhi Cilnidipine constituted to 86.65%, Amlodipine 84.55%, Nifedipine 79.52%, Verapamil 69.84% and Diltiazem constituted to 62.99% when compared to brand medication.

Beta blocker

Among Beta blockers, Atenolol 50mg [₹ 12.85/ 30tab], was least expensive followed by Propranolol 40mg and Metoprolol 25mg both constituted ₹18.00/30 tablets, followed by Carvedilol 6.25mg [₹ 21.00/30 tab], Bisoprolol 5mg[₹ 99.00/30 tab], Nebivolol 5mg [₹ 120/ 30 tab] and Labetalol 100mg[₹ 123.00/30 tab]. Percentage benefit of Jan Aushadhi Carvedilol constituted to 90.00%, Propranolol 88.31%, Metroprolol 87.36%, Labetalol 81.01%, Atenolol constituted to 80.68%, Nebivolol 75.08% and Bisoprolol 68.85% when compared to brand medication.

Alpha blockers

Among, oral Alpha blockers only Prazosin 5mg was prescribed and its Jan Aushadhi cost was ₹ 56.00/ 30tab. Percentage benefit of Jan Aushadhi Prazosin 5mg constituted to 87.56% when compared to brand medication.

Angiotensin receptor blockers

Among angiotensin receptor blockers Telmisartan 40mg and Losartan 50mg were the least in cost i.e., ₹ 33.00/30 tablets, followed by Olmesartan 20mg [₹ 45.00/ 30tab]. Percentage benefit of Jan Aushadhi Losartan constituted to 87.35%, Olmesartan constituted to 86.36% and Telmisartan constituted to 82.84% when compared to brand medication.

Angiotensin converting enzyme inhibitors

Among prescribed oral Jan Aushadhi Angiotensin converting enzyme inhibitors, Enalapril 5mg was less expensive [₹ 15.00/ 30tab] compared to Ramipril 5mg which constituted to ₹ 27.00/ 30tab. Percentage benefit of Jan Aushadhi Enalapril constituted to 91.64% and Ramipril constituted to 89.71% when compared to brand medication.

Diuretics

Within Jan Aushadhi oral diuretics, Furosemide 40mg was the least expensive [₹ 6.90/ 30tab], followed by Spironolactone 50mg [₹ 28.28/ 30tab], Torsemide 10mg [₹ 30.00/ 30tab] and Indapamide [₹ 78.00/ 30tab]. Percentage benefit of Jan Aushadhi Torsemide constituted to 82.33%, Indapamide 80.28%, Furosemide 75.25% and Spironolactone 59.86% when compared to brand medication.

Centrally acting sympatholytics

Among prescribed oral Jan Aushadhi centrally acting sympatholytics, Clonidine 100mcg was less expensive [₹ 27.00/ 30tab] compared to Moxonidine 0.3mg which constituted to ₹ 141.00/ 30tab.

Percentage benefit of Jan Aushadhi Clonidine constituted to 62.84% and Moxonidine constituted to 59.66% when compared to brand medication.

Vasodilators

Among, oral Vasodilators only Nitroglycerin 2.6mg was prescribed and its Jan Aushadhi cost was ₹ 68.00/ 30tab. Percentage benefit of Jan Aushadhi Nitroglycerin constituted to 62.96% when compared to brand medication.

Cost minimization analysis of oral antihypertensives in Fixed Dose

Combination

Among Fixed Dose Combinations, combination of CCB +BB [Amlodipine + Atenolol(5+50) mg] was less expensive, followed by ARB+Diuretic [Losartan + Hydrochlorthiazide (50+12.5) mg], CCB+BB [Amlodipine + Metoprolol (5+50) mg] combination. Losartan+Hydrochlorthiazide [50+12.5] mg Jan Aushadhi combination constituted. The highest percentage benefit of 92.22% when compared to brand medication.

DISCUSSION

According to the study, Jan Aushadhi diuretics had the lowest cost followed by other classes; these results were comparable with other studies where cost of diuretics were less compared to other class of antihypertensives.[7] In the present study it was found that percentage benefit of Jan Aushadhi medicine was significantly high when compared with both brand and alternative generic medicines. Which was similar to the study carried out by Das SC et al., where the costly brand of same generic drug is scientifically proved to be in no way superior to its economically cheaper Counterpart.[8] Contrasting to developed countries, people in developing countries pay the cost of medicines out-of-pocket. In India, more than 80% health financing is borne by patients.[9] The efficacy of both the branded and generic drugs were found to be same, thus reducing the cost burden of disease which in turn may increase the adherence, helping in managing the chronic condition.[10] Rational prescribing involves selecting the cost effective treatment.[11]

CONCLUSION

In Cost minimization analysis, Jan Aushadhi antihypertensive drug cost was low compared to brand drugs and counter generic composition. Among combination therapy, ARB+CCB costed the least. As per the study, percentage benefit of Jan Aushadhi was found to be high in contrast to branded medications and generic drugs even though the efficacy of both the drugs were found to be same, thus reducing the cost burden of disease which in turn may increase the adherence, helping in managing the chronic conditions.

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