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PATTERN OF DRUG UTILIZATION AND FACTORS INFLUENCING LONG TERM BLOOD PRESSURE CONTROL AMONG HYPERTENSIVES IN A TERTIARY CARE HOSPITAL- AN OBSERVATIONAL STUDY

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ABSTRACT

Objectives: To study the pattern of drug utilization among hypertensives with level of blood pressure control and to study the factors which influence the medication failure and adherence to treatment. **Methods:** The clinical study was conducted in JJM Medical College and Karuna trust, Davangere, Karnataka. The patients (n=51) with hypertension as diagnosed by consultant physician were observed for the pattern of blood pressure control as per JNC 8 criteria. The blood pressures of the patients were recorded at the end of 1st month, 6th month and 12th month of their treatment period. The pattern of drugs prescribed were also analyzed. The pattern of control among patients with comorbidities were also analyzed using paired sample 't' test. **Results:** The results showed that the prescribed drugs were able to control the blood pressure of the patients. The systolic and diastolic blood pressure control was increased from 41% and 74.5% at the start of the treatment to 69% and 96% at the end of one year treatment (P<0.01). The pattern of drug utilization showed that the most commonly

used drugs were the Atenolol+Amlodipine combination (23.5%), Amlodipine alone (19.6%), Atenolol alone (19.6), Telmisartan alone (13.7) and combination of Telmisartan + Hydrochlorthiazide (9.8). The reasons for failure of treatment and adherence to treatment were followup irregularity (18.8%), smoking(15.6%) and polypharmacy (12.5%). **Conclusion:** The results show that the intervention by the consultant physician was successful in controlling the hypertension. Further such studies in a larger sample will help the consultants in their treatment methods.

KEYWORDS: Antihypertensives, Drug utilization study, Medication adherence.

INTRODUCTION

WHO health report 2002 of the world health organization states that high Blood pressure is the primary or secondary cause of 90% of all cardiovascular disease worldwide. In India, hypertension has increased in both urban and rural subjects and presently is 25% in urban adults and 10-15% among rural adults.[1] Worldwide, hypertension is estimated to cause 7.5 million deaths, about 12.8% of the total deaths. Hypertension accounts for 57 million Disability Adjusted Life Years (DALY) or 3.7% of total DALYS.[2] The characterization of drug utilization can be extended linking prescription data to the reasons for the drug prescribing. The concept of appropriate treatment can be assessed relative to indication for treatment, concomitant diseases and the use of other drugs (polypharmacy).[3] Drug utilization is defined by WHO (World Health Organization) as the marketing, distribution, prescription and use of drug in a society, with a special emphasis on the resulting medical, social and economic consequences.[4] Therapeutic practice is based on evidence provided by these drug utilization studies and pre-marketing clinical trials, but complementary data from post-marketing period are essential for improving drug therapy. Drug utilization study can be used study the burden of the disease on the individual and family in terms of associated adverse reactions, medication failure, and economic consequences. We can also determine the adherence of patient to the treatment regimen and reasons for non-compliance of the treatment using the drug utilization studies.[3,4]

Objectives of the study

1. To study the pattern of drug utilization among hypertensives with level of blood pressure control due to hypertension.
2. To study the factors which influence the medication failure and adherence to treatment.

METHODOLOGY

The clinical study was conducted in JJM Medical College and Karuna trust, Davangere, Karnataka. The patients with hypertension as diagnosed by consultant physician were observed for the pattern of blood pressure control as per JNC 8 criteria. The blood pressures of the patients were recorded at the end of 1st month, 6th month and 12th month of their treatment period. The study period was from june 2015 till august 2017. The study was conducted after institutional ethical clearance and informed consent was taken from all the patients. The pattern of drugs prescribed for the patients were also analyzed. The pattern of control among patients with comorbidities were also analyzed using paired sample 't' test. A total of 51 patients (n=51) who completed the one year of treatment were included in the study.

Inclusion criteria

1. Patients of either sex, aged above 21 years, irrespective of their socioeconomic background.
2. Patients with newly diagnosed hypertension, defined as systolic BP of more than 140mm Hg and or diastolic BP more than 90 mm Hg on consecutive visits, with or without Diabetes Mellitus, as diagnosed by consultant physician.
3. Patients who are eligible to participate and who can give written informed consent.

Exclusion criteria

1. Any surgical or medical condition which significantly alters absorption, metabolism and excretion of medication.
2. Patients with myocardial infarction, cerebrovascular accident, history of hypertensive encephalopathy or malignancy within past one year were excluded.
3. Patients with secondary form of hypertension.
4. Patients whose treatment regimen was altered.

Criteria for categorization after treatment (Based on JNC 8 criteria)

Uncontrolled	>140/90 for patients < 60yrs of age >150/90 for patients > 60yrs of age
Moderately controlled	130/86 ---140/90 for patients < 60yrs of age 130/86 ---150/90 for patients > 60yrs of age
Controlled	<130/85

RESULTS

1. Comparison of systolic blood pressure values of patients after one month of treatment (S1) and after one year of treatment (S3)

	S1 categories-after one month treatment		S3 categories- after one year treatment	
	Number of patients	Percentage	Number of patients	Percentage
Controlled	4	7.8	24	47.1
Moderate control	17	33.3	11	21.6
Uncontrolled	30	58.8	16	31.4
Total	51	100.0	51	100.0

2. Comparison of diastolic blood pressure values of patients after one month of treatment (D1) and after one year of treatment (D3)

	D1 categories-after one month treatment		D3 categories-after one year treatment	
	Number of patients	Percentage	Number of patients	Percentage
Controlled	8	15.7	28	54.9
Moderate control	30	58.8	21	41.2
Uncontrolled	13	25.5	2	3.9
Total	51	100.0	51	100.0

3. Comparison of mean values diastolic blood pressure values at the end of one month (D1) and at the end of one year (D3)

Paired Samples Test								
	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
D1 -D3	5.529	6.370	.892	3.738	7.321	6.199	50	.000

4. Comparison of mean values systolic blood pressure values at the end of one month (S1) and at the end of one year (S3)

Paired Samples Test								
	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
S1 - S3	10.706	11.564	1.619	7.453	13.958	6.611	50	.000

4. Comparison of mean values systolic blood pressure values at the end of one month (S1) and at the end of one year (S3)

Level of control both systolic and diastolic				
Level of control	**At the end of one month**		**At the end of one year**	
	Number of patients	**Percentage**	**Number of patients**	**Percentage**
1	1	2	19	37.3
2	19	37.3	26	51
3	31	60.8	6	11.8
	51	100	51	100

6. Medications given

Medications	**Number of patients**	**Percentage**
1. Atenolol +Amlodipine	12	23.5
2. Telmisartan +hydrochlorthizide	5	9.8
3. Telmisartan	7	13.7
4. Amlodipine	10	19.6
5. Atenolol + Indapamide	2	3.9
6. Atenolol	10	19.6
7. Lisinopril	1	2
8. Amlodipine+Atenolol+Frusemide	2	3.9
9. Amlodipine+Atenolol+Telmisartan	2	3.9
Total	51	100

7. Reasons for uncontrolled hypertension at the end of one year period

	Number of patients	**Percentage**
1. Unknown reasons	12	23.5
2. Followup irregularity	6	11.8
3. Non-compliance due to side-effects	0	0.0
4. Illitracy, medication unawareness, lack of diet control	3	5.9
5. Polypharmacy, comorbidities	4	7.8
6. Bad habbits-tobacco chewing, smoking	5	9.8
7. Economic reasons	2	3.9
8. Total	32	62.7
9. Well controlled patients	19	37.3
Total	51	100.0

DISCUSSION

The world health report 2013, research for universal health coverage addresses question about prevention and treatment, about how services can be paid for by individuals and government. WHO aims at targeting major risks to ischemic heart disease and stroke, such as reducing blood pressure, cholesterol and body mass index to appropriate levels. The total

population impacts in terms of DALYs averted are relatively large, though generally slightly smaller than the benefits gained from treating hypertension. Worldwide, hypertension is estimated to cause 7.5 million deaths, about 12.8% of the total deaths. Hypertension accounts for 57 million disability adjusted life years (DALY).[1,7] Drug utilization research is an essential part of pharmacoepidemiology as it describes the extent, nature and determinants of drug exposure. The most commonly used monotherapies worldwide and India are Calcium channel blockers and Angiotensin converting enzyme inhibitors.[8] In our study, Atenolol (35%), Amlodipine(35%) Telmisartan(25%), and Lisinopril(3%) were the most commonly used monotherapies in order of their preference. Global action plan on prevention and control of non-communicable diseases 2013-2020 recommends that member states standardize data collection on risk factors.[5] Most of risk factors for the hypertension remain the same reasons to be addressed for chronic uncontrolled hypertension. In our study, we found some of the factors for high blood pressure and chronic high blood pressure, such as smoking[9.8], comorbidities(7.3%), Illitracy(6.9%), and followup irregularity(1.8%). In our study the systolic and diastolic blood pressure values of patients after one month of treatment(S1, D1) to after one year of treatment (S3, D3) after applying paired sample T test showed significant p value (0.00 and 0.00) respectively. The study provides an overview about utilization of antihypertensives among our study patients in our hospital and reasons for non-adherence to the treatment leading to chronic uncontrolled. Effective hypertensive care requires a systematic approach in the community. Encouraging self monitoring of blood pressure, regular followups, educational interventions to the family members are key factors for effective care. Recent advances in patient care are the mobile application based reminders for timely checkups which can avert the complications in long term. Further research on hypertension epidemiology in a larger set of population can bring valuable inputs for better management and quality care.

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REFERENCES

1. Lloyd-Jones DM, Levy D. Epidemiology of Hypertension. Hypertens A Companion to Braunwald's Hear Dis Second Ed, 2013; 61(February): 1–11.
2. Midha T, Nath B, Ranjeetha K, Rao YK, Panday U. Prevalence of hypertension in India; A meta-analysis. World journal of meta analysis, 2013; 1(2): 83-89.

3. Leite SN, Vieira M, Veber AP. Drug utilization studies: published in Brazil and Latin America. Cien Saude Colet [Internet], 2008; 13 Suppl: 793–802. Available from: http://www.ncbi.nlm.nih.gov/pubmed/21936184.
4. Kumar GA, Kumar DC, Ajay K, Mathimita R. Drug utilization study on antibiotics use in an orthopedics department of a tertiary care hospital in West Bengal. Journal of drug delivery and Therapeutics, 3(2): 98–103.
5. Gee ME, Campbell N, Sarrafzadegan N, Jafar T, Khalsa TK, Mangat B, Poulter N. Standards for uniform reporting of hypertension in adults using population survey data recommendations from the world hypertension league expert committee. The journal of clinical hypertension, 2014; 16(11): 773-781.
6. Yang S, Jeong GH, Kim SJ, Lee SH. Correlates of self-care behaviour among low-income elderly women with hypertension in S. Korea. Journal of Obstetric, gynecologic and neonatal nursing, 2014; 43(1): 95-106.
7. Glynn LG, Murphy AW, Smith SM, Schroedar K, Fahey T. Interventions used to improve control of blood pressure in patients with hypertension(Review). The cochrane library, 2010; 3: 1-12.
8. Usha devi KH, Rubiya S, Vigneshwaran E, Reddy YP Drug use evaluation of hypertensive medications in outpatients in a secondary care hospital. Asian journal of pharmaceutical and clinical research, 2013; 6(2): 72-74.