Evaluation of medication adherence on hypertensive patients in a tertiary care hospital

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ABSTRACT

The Present study aims to evaluate the Medication Adherence on hypertensive Patients in a tertiary care hospital located in Bhavani. We used descriptive, Cross-sectional study of over 185 patients who were admitted in the period of October 2020 to March2021. The Descriptive Data collection form and Morisky tool were used as the data collection tool. Our study reports that Patient with hypertension have Poor medication adherence so, the pharmacists need to work hard to improve the medication adherence in patients

Keywords: Hypertension, Medication Adherence, Morisky Scale, Cross-sectional Study

INTRODUCTION

Hypertension is a significant public health problem in many countries. It remains an important public health challenge and one of the most important risk factors for coronary heart disease, stroke, heart failure and end stage renal disease. Cardiovascular diseases have emerged as an important health problem in India. High blood pressure (BP) is a major risk factor and better control can lead to prevention of 300,000 of the 1.5 million annual deaths from cardiovascular diseases in India Epidemiological studies demonstrate that prevalence of hypertension is increasing rapidly among Indian urban populations and using the current definitions more than two-fifths of the Indian urban adult population has hypertension. In India, t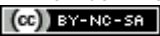he prevalence of hypertension reports was increasing rapidly in the urban, i.e. 25% of adults, and gradually even in rural areas, i.e. 10% of individuals are affected. In 2005, a worldwide data showed that 639 million patients with hypertension are seen in low- and middle-income countries and predicted that which may rise to about 60% in 2025

Survey reports on hypertension prevalence conducted in community over a period of three to six decades showed an increase of 30% in urban population (1.24%-36.4%) and 10% in rural population (1.99%-21.2%).

Hypertension: It is defined simply as persistently elevated arterial blood pressure. It is a heterogeneous disease in which, it result from unknown patho physiologic etiology (essential or primary hypertension). This form of hypertension

can be controlled but cannot be cured. A small percentage of patients have a specific cause of their hypertension (secondary hypertension). The JNC8

classification of BP in adults (age> 18years) is based on the average of two or more properly measured BP readings from clinical encounters.

Classification of blood pressure in adults (Age>18 years) (JNC 8 guideline 2014)

Classification	Systolic BP (mm Hg)	Diastolic BP (mm Hg)
Normal	Less than 120	Less than 80
Prehypertension	120-139	80-89
≥60 years	≥150 mm Hg	≥90 mm Hg
<60 years	≥140 mm Hg	≥90 mm Hg

Pathophysiology: Hypertension is a heterogeneous disorder that may result either from a specific cause (secondary hypertension) or from an underlying pathophysiological mechanism of unknown etiology (primary or essential hypertension). Secondary hypertension accounts for fewer than 10% of cases, and most of these are caused by chronic kidney disease or Reno vascular disease. Other conditions causing secondary hypertension include Pheochromocytoma, Cushing's syndrome, and Hyperthyroidism. Hyperthyroidism, primary aldosteronism, pregnancy, obstructive sleep apnea, and coarctation of the aorta. Some drugs that may increase BP include corticosteroids, estrogens, non-steroidal anti-inflammatory drugs (NSAIDs), amphetamines, sibutramine, cyclosporine, tacrolimus, erythropoietin, andvenlafaxine.

Multiple factors may contribute to the development of hypertension including:[6]
* Humoral abnormalities involving the renin-angiotensin-aldosterone system, natriuretic hormone, or hyperinsulinemia;
* A pathologic disturbance in the CNS, autonomic nerve fibers, adrenergic receptors, or baroreceptors;
* Abnormalities in either the renal or tissue auto-regulatory processes for sodium excretion, plasma volume, and arteriolar constriction;
* A deficiency in the local synthesis of vasodilating substances in the vascular endothelium, such as prostacyclin, bradykinin, and nitric oxide, or an increase in production of vasoconstricting substances such as angiotensin II and endothelin I;
* A high sodium intake and increased circulating natriuretic hormone inhibition of intracellular sodium transport, resulting in increased vascular reactivity and a rise in BP;
* Increased intracellular concentration of calcium, leading to altered vascular smooth muscle function and increased peripheral vascular resistance.

MEDICATION ADHERENCE

According to WHO Medication Adherence is defined as the extent to which a person's behaviour

taking medication corresponds with agreed recommendations from a health care provided Adherence (compliance) to a medication regimen is generally defined as the extent to which patients take medications as prescribed by their health care providers. The word "adherence" is preferred by many health care providers because compliance" suggests that the patient is passively following the doctor's orders and that the treatment plan is not based on a therapeutic alliance or contract established between the patient and the physician. The language used to describe how patients take their medications needs to be reassessed, but these terms are still commonly used. Regardless of which word is preferred, it is clear that the full benefit of the many effective medications that are available will be achieved only if patients follow prescribed treatment regimens reasonably closely. Poor medication adherence and lack of knowledge and awareness on hypertension are the major reasons for poor BP control which is largely related to deterioration in a patient's quality of life.

Measures of Adherence

Adherence to medication regimens has been monitored since the time of Hippocrates, when the effects of various portions were recorded with notations of whether the patient had taken them or not.

Even today, patients' self-reports can simply and effectively measure adherence. The methods available for measuring adherence can be broken down into direct and indirect methods of measurement. Each method has advantages and disadvantages and no method is considered the gold standard. Directly observed therapy measurement of concentrations of a drug or its metabolite in blood or urine, an detection or measurement in blood of a biologic marker added to the drug formulation are examples of direct methods of measures of adherence. Direct approaches are expensive, burdensome to the health care provider, and susceptible to distortion by the patient. However, for some drugs, measuring these levels is a good and commonly used means of assessing adherence. For instance, the serum concentrations of antiepileptic drugs

such as phenytoin or valproic acid will probably reflect adherence to regimens with these medications, and sub-therapeutic levels will probably reflect poor adherence or suboptimal dose strengths. Indirect methods of measurement of adherence include asking the patient about how easy it is for him or her to take prescribed medication, assessing clinical response, performing pill counts, ascertaining rates of refilling prescriptions, collecting patient questionnaires using electronic medication monitors, measuring physiologic markers, asking the patient to keep a medication diary, and assessing children's adherence by ask if a caregiver, school nurse, or teacher. Questioning the patient (or using questionnaire). Patient diaries and assessment of clinical response are all methods Depart that are relatively easy to use, but questioning the patient can be susceptible to misrepresentation and tends to result in the health care provider's overestimating the patient's adherence.

The use of a patient's clinical response as a measure is confounded by many factors other than adherence to a medication regimen that can account for clinical outcome. The most common method used to measure adherence, other than patient questioning, has been pill counts (i.e., counting the number of pills that remain in the patient's medication bottles or vials). Although the simplicity and empiric nature of this method are attractive to many investigators, the method is subject to many problems, because patients can switch medicines between bottles and may discard pills before visits in order to appear to be following the regimen. For these reason, pill counts should not be assumed to be a good measure of adherence. In addition this method provides no information on other aspects of taking medications, such as dose timing and drug holidays (i.e., omission of medication on three or more sequential days), both of which may be important in determining clinical outcomes. Hypertension Consistent control of blood pressure requires that patients with hypertension follow medication and dietary regimens. However, antihypertensive therapy may have untoward side effects and result in little symptomatic relief, since hypertension often causes no symptoms. No matter how effectively the clinician communicates the benefits of antihypertensive therapy, patients are still ultimately responsible for taking their medications. Since adherence is enhanced when patients are involved in medical decisions about their care and in monitoring their care, the traditional model of the authoritarian provider should be replaced by the more useful dynamic of shared decision making by the health care provider and the patient. The patient must actively participate in the selection and adjustment of drug treatment and in changes in lifestyle in order to maximize the usefulness of regimen. When feasible, self-monitoring of blood pressure can also enhance adherence. Simplifying instructions to the patient and medication schedules is essential, and minimizing the total number of daily doses has been found to be more important in promoting adherence than minimizing the total number of medications.

FACTORS INFLUENCING ADHERENCE[10]

Variables influencing adherence can be classified into patient related factors system related factors and caregiver relate

PATIENT BARRIERS	PROVIDER BARRIERS	HEALTH CARE SYSTEM BARRIERS
• Poor health care literacy (i.e., Patient don't properly understand their illness and the importance of their medication) • Inability to pay • Lack of drug coverage. • Lack of understanding of how to use their medication. • Low motivation / self • Efficacy (Eg Patients are not confident their medication will help) • Forgetfulness • Concern about side effects • Poor communication with provider	• Lack of knowledge and poor communication with patients about drug costs. • Lack of knowledge about insurance coverage for different formularies. • Lack of knowledge about patient adherence • Complex regimens make it difficult to provide patients with proper information about safe and appropriate medication use.	• High drug costs administrative issues. (Eg. Formulary complexity, prior authorization requirements). • Insufficient Access to and coverage for medications • Inadequate health • Information technology solution.

MEDICATION ADHERENCE TOOLS

Medication Adherence Questionnaire (MAQ)[3]
The best known and most widely used scales for research adherence is the Medication Adherence Questionnaire (MAQ) by Morisky et al.', which has several advantages: identifies barriers to non-adherence, it is the shortest, easiest to score and very adaptable for various groups of medication. MAQ identifies barriers to non-adherence but not self-efficacy. Adherence to the medical regimen continues to rank a major clinical problem in the management of patients with essential hypertension, as in other conditions treated with drugs and lifestyle modification. The psychometric properties and the concurrent and predictive validity of a structured four-item self-reported adherence measure (alpha reliability-o61) can be easily integrated into the medical visit. Items in the scale address barriers to medication-taking and permit the health care provider to reinforce positive adherence behaviors. Information obtained with this questionnaire could be used to counsel patients regarding the importance of questionnaire medication adherence.

METHODOLOGY

The Study was conducted in a tertiary care Hospital, Bhavani. A total of 200 patients were selected in a study period of 6 months. The study was based on some inclusion and exclusion criteria Patient who meet the following criteria will be requested to participate in this study:

1. Patients who has been diagnosed with hypertension.
2. Patients who were 18 years and above of either sex.
3. Those who were on prescribed antihypertensive medications for at least one month.

Patients who agreed to participate were need to be explained the nature and the objectives of the study, and take the informed consent forms from the patients.

Exclusion criteria:
1. Pregnant/lactating women.
2. Patients with psychological illness

Sample size: A plan to approach not less than 200 patients.

Material used: Informed consent form, Patient data collection form includes Demographical details of patients (Education, income, co morbidity), abnormal lab investigations and details of drugs prescribed patient. Morisky medication adherence scale included with data collecting form to access the medication adherence.

Sources of data: Outpatients- Prescriptions.

Questionnaire used in this study: The instrument used in this study consisted of three parts: part one collected socio-demographic, Clinical and medication data obtained directly from patients to their medical files; part was medication adherence test.

Morisky Medication Adherence Scale (MMAS)
Medication adherence was tested using the validated eight item Morisky Medication Adherence Scale (MMAS8). MMAS-8 is an 8-item questionnaire with 7 yes/no questions while the last question was a 5-point Likert scale. Based on the scoring system of MMAS, adherence was rated as follows: high adherence (=8), medium adherence (6 to 8) and low adherence (<6). Patients who had a low or a moderate rate of adherence were considered as non-adherent.

RESULTS:
Table no: 1 Gender wise Distribution of hypertensive patients:

Gender	Number of patients (n=185)	Percentage
Male	104	56.2%
Female	81	43.8%

Table no: 2 Age wise distribution of hypertensive patients:

Age in years	No. of patients (n=185)	Percentage
18-44	17	9.1%
45-64	106	57.2%
≥65	62	33.7%

Table no: 3   Hypertensive patients based on occupation:

Occupation	Number of patients (n=185)	Percentage
Employed	86	46.7%
Unemployed	43	23.2%
House wife	56	30.1%

Table no: 4 Distribution of tobacco consumption of hypertensive patients

Tobacco consumption	Number of patients (n=185)	Percentage
Yes	74	40.0%
No	111	60.0%

Table no: 5 Distribution of alcoholism of hypertensive patients

Alcoholism	Number of patients (n=185)	Percentage
Alcoholic	62	33.5%
Non alcoholic	123	66.5%

Table no: 6 Distribution of diet of hypertensive patients:

Diet	Number of patients (n=185)	Percentage
vegetarian	25	13.5%
Non vegetarian	160	86.5%

Table no: 7 Hypertensive patients based on other chronic disease:

Name of chronic disease	Number of patients (n=185)	Percentage (%)
Diabetes Mellitus	22	12
Renal failure	17	9
Chronic heart failure	13	7
None	133	72

Table no: 8 Hypertensive patients based on their therapy type

Therapy type	Number of patients (n=185)	Percentage
Mono therapy	102	55.1%
Multi therapy	83	44.9%

Table no: 9 Hypertensive patients based on their classes of drugs:

Class of drugs	No of prescription (n=185)	Percentage
Beta Blockers	180	97.2%
ACE inhibitors	31	16.7%
Angiotension-II Antagonist	36	19.4%
CCB'S	19	10.27%

Table no: 10 Anti -Hypertensive Medications on Hypertensive patients prescription:

Drugs	Number of patients (n=185)	Percentage (%)
Atenolol	111	60%
Metoprolol	69	32%
Captopril	13	7%
Ramipril	18	9.7%
Telmisartan	20	10.8%
Olmesartan	16	8.6%
Amlodipine	19	10.2%

Table no: 11 Medication adherence score:

Category	No. of patients	Percentage %
Low adherence	101	55
Medium Adherence	49	26
High adherence	35	19

DISCUSSION
In this study, we have collected all the details in data collection form and it is evaluated by using the MMAS (Morisky Medication Adherence scale). Initially, we choosed 200 patients for this study. Out of 200patients, 185patients were answered remaining patients are refused to participate in the questionnaire. From the 185 patients, 56.2% patients were males and 43.8% Patients were females. On the basis of age wise distribution 57.2% patients were in-between the age of 45-64, 33.7% of patients were above the age of 65. While considering the occupation of the Hypertensive patients 46.7% were employed, 23.2% of patients are unemployed and 30.1% are House wives. 40% of the Hypertensive patients consume tobacco and

60% of them are not. 66.5% of them are Non Alcoholics and33.5% of them are Alcoholics. The food style wise distributions were 86.5% of hypertensive patients are Non vegetarians & 13.5% of Patients are vegetarians. 28% of Hypertensive patients are associated with other chronic diseases like Diabetes Mellitus, Renal Failure, Chronic heart failure remaining 78% of them don't have any of these chronic diseases. 55.1% of patients are taking mono therapy while 44.9% of them are taking Multi therapy. 97.2% of patients were prescribed Beta blockers and left patients were prescribed by Classes like ACE inhibitors, Angiotension-II Antagonist and calcium channel Blockers. After finalizing the overall questionnaire with MMAS, we found that 55% of the Patients are low adherence, 26 % of Patients are Medium Adherence and 19 % of patients are high adherence.

CONCLUSION: Out of 185 patients-35Patients (19%) Having High adherence their medication, followed by 49(26%) having medium adherence, and 101(55%) having low adherence. Around 55%, Patients comes under low adherence, it can lead to uncontrolled Hypertension. Uncontrolled hypertension may contribute to heart failure, kidney disease, atherosclerosis, and stroke. Medication adherence playing vital role to control the hypertension, medium adherence and low adherence can worsen the patient condition, here pharmacist need to work hard improve the medication adherence by providing patient counseling about their disease and drug. This study shows that more number of patients are poor in adherence, so the healthcare workers like Pharmacist and Nurses need to educate the hypertensive patients with proper diet counseling, Non Pharmacological treatments – Physical exercise, mimizing the salt intake, smoking cessation, limit Alcohol intake & Manage stress.

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