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ADHERENCE TO ANTIHYPERTENSIVE MEDICATION: ROLE OF PATIENTS' AWARENESS ABOUT THE DISEASE AND ITS COMPLICATIONS

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ABSTRACT

Introduction: Hypertension is a major public health problem in India and its prevalence is rapidly increasing among both urban and rural population. Hypertensives when compared to normotensives, develop twice as much coronary heart disease (CHD), four times congestive heart disease (CHF) and seven times stroke. According to World Health Organization, adherence to medication in patients with chronic diseases averages 50% in developed countries and is reported to be worse in developing countries. Lack of knowledge about the disease and its complications lead to poor medication adherence. This study was conducted to estimate the rate of adherence and the factors affecting it in hypertensive patients in Pune and Pimpri-Chinchwad area. **Aim:** To study the adherence to antihypertensive medication and the factors affecting it among the hypertensive patients. **Methodology:** The study was conducted among 100 hypertensive patients who were on treatment since at least one year. The questionnaire was developed using Hill-Bone Adherence to Blood Pressure Therapy Scale and 8-item Morisky Medication Adherence Scale (MMAS.13,21). **Results:** At the time of survey, 49% participants had uncontrolled hypertension. 74% participants didn't know the normal and hypertensive BP range. Only 50% knew the complications of untreated HTN. 56% were non-adherent to the treatment. 40% often decide not to take medication because they start disliking them. 40% often decide to take less medication as they feel their blood pressure is under control. 58% were unaware of the consequences of suddenly stopping the medication. 43% did not know importance of lifestyle modification in controlling blood pressure. 97% strongly felt that their knowledge about the disease & complications will improve their adherence to treatment.

KEYWORDS: Antihypertensive medication, adherence, disease awareness, complications.

INTRODUCTION

Hypertension affects about one billion people worldwide[1] and it is estimated that by 2025, up to 1.56 billion adults worldwide will be hypertensive.[2] Hypertension is a major public health problem in India and its prevalence is rapidly increasing among both urban and rural populations.[3,4]

Hypertension in adults aged 18 years and older who are not acutely ill is defined as 'Systolic Blood Pressure of 140 mm of Hg or greater and/or Diastolic Blood Pressure of 90 mm of Hg or greater or any level of blood pressure taking anti-hypertensive medication.'[5]

The prevalence of complications due to poor control of hypertension is rapidly increasing in developing countries and is likely to be related to changing life-styles and to an increased life expectancy. It is estimated that 16% of ischaemic heart disease, 21% of peripheral vascular disease, 24% of acute myocardial infarctions and 29% of strokes are attributable to hypertension, underlining the huge impact effective hypertension prevention and control can have on reducing the rising burden of cardiovascular disease.[5]

Hypertensives when compared to normotensives, develop twice as much coronary heart disease (CHD), four times as much as Congestive heart failure (CHF) and seven times as much stroke.[5]

Patients take only 50% to 70% of the prescribed doses of antihypertensive medications and 50% of patients

discontinue their antihypertensive treatment within first year. In addition, up to 75% of patients do not achieve target BP.[6] According to World Health Organization, adherence to medication in patients with chronic diseases averages only around 50% in developed countries. The situation is reported to be worse in developing countries due to poor accessibility to medications and health care services.[6] Adherence is defined as 'the extent to which a person's behavior corresponds with agreed recommendations from a health care provider.'[6] Poor medication adherence is a major cause of failure to achieve BP control.[7] Adherence to medication can be measured using indirect methods, which include patients' self-report, field count, pharmacy refill rate and electronic medication monitors.[8]

This study was conducted to estimate the rate of adherence and the factors that might affect the adherence to medications in hypertensive patients using a standard questionnaire as it has the advantages of being simple and effective.

Aim of the study: To study the adherence to antihypertensive medication and the factors affecting it among the hypertensive patients.

Objectives

- To measure the adherence to antihypertensive medications in patients with hypertension
- To identify the factors responsible for non-adherence to the medication

MATERIALS AND METHODS

Study design and population

The study was conducted among 100 hypertensive patients. Institutional Ethics Committee approval was taken before beginning of the study. Written informed consent was obtained from the patients after explaining the purpose of the study, in language they understood.

Individuals of either sex, age $\geq$ 18 years with primary hypertension and on treatment since at least one year were included in the study. Pregnant women and patients who refused to give informed consent were excluded from the study.

Study method

This was community based cross-sectional study. A structured pre-validated questionnaire was used to gather demographic details, disease and treatment history of the patient. The questionnaire also assessed their knowledge about the treatment and complications of the disease. Face to face interview with the patients were conducted while explaining the questionnaire in the language they understood. Patients were required to choose their response from a set of possible answers for easy administration and minimize inconsistencies among different interviewers.

Blood pressure was recorded using mercury sphygmomanometer at the time of interview. An average of three recordings of BP from right upper arm of a seated patient who has been resting for 10 to 15 minutes was taken.

The questions in Medical Adherence Scale used in the study were developed using Hill-Bone Adherence to Blood Pressure Therapy Scale and 8-item Morisky Medication Adherence Scale (MMAS.13,21). High reliability and validity has been reported for these two tools of adherence measurement.[9,10] A total of six questions relevant to the local setting were selected from these questionnaires and condensed to form the modified Medication Adherence Scale. Each question has a four-point Likert-type response format; each response carrying a score:
None of the time = 4, Some of the time = 3, Most of the time = 2, and All of the time = 1

Total score was added for each patient which ranged from 6 (minimum) to 24 (maximum). Lower score reflected poor adherence to therapy.

A full score of 24 or a score of 23 (due to one-point deduction from unintentional non-adherence question, which are question 1 and question 5) was defined as adherence. A score of 22 or below was categorized as non-adherence.

RESULTS

The study consists of 100 participants out of which 52% males. 90% participants were above 40 years of age with 38% being above 60 years. 63% participants were educated till secondary class (10th standard) only. 55% participants had HTN for less than 5 years and were on anti-hypertensives.

Table I: Distribution of the patients according to socio-demographic factors	
Gender	
Male	52
Female	48
Age	
<20 years	1
21-50 years	29
>50 years	70
Education	
Illiterate	26
Educated	44
Higher education	30
Monthly income	
<10,000	9
10,000-50,000	16
Not available	75
Duration of HTN	
< 5 yrs	55
>5 yrs	45

In 44% of the participants BP was controlled (BP <140/90) at the time of participating in the study while 56% were uncontrolled hypertensives. Among uncontrolled hypertensives 19% were isolated systolic hypertensives and 9% were isolated diastolic hypertensives.

74% participants did not know the normal BP range. 91% participants didn't know that BP> 140/90 is HTN; 22% of which were educated (higher secondary, graduates, post-graduates). It is important to regularly check the BP so as to adjust the doses of the drugs. In the study, we found that 40% participants were not checking their BP regularly. Only 48% participants checked their BP monthly.

22% participants were diagnosed at the time of routine check-up. 78% were symptomatic at the time of diagnosis and this speaks about importance of routine check-up. In the study the most common presenting complaint was dizziness followed by chest pain.

Table II: Knowledge regarding Blood Pressure	
BP at time of interview*	
Controlled	44
Uncontrolled	56
Frequency of checking BP	
0 – 1 month	48
2 – 3 month	12
Irregularly	40
Normal BP	
Know	26
Don't know/ Incorrect	74
Range of BP for HTN > 140/90	
Knows	9
Don't know	76
Incorrect	15
Reason for checking BP at time of diagnosis	
Chest pain	17
Routine	22
Dizziness	21
Blurring of vision	5
Others[#]	35

* [controlled < 140/90] [uncontrolled >140/90]
[#] Sweating, stroke, headache, epistaxis, palpitation, heart attack

Regarding the treatment
55% participants were not explained by their physicians about the complications of uncontrolled hypertension. 58% participants were unware of the consequences of suddenly stopping the medication. 43% participants did not know importance of lifestyle modification in

controlling blood pressure. Those who knew, only few of them were following it.

9% participants were on alternative therapy other than allopathy for control of hypertension; mostly ayurvedic medications.

54% participants had comorbid conditions; commonest of which was diabetes mellitus. Only 50% participants knew the complications of uncontrolled HTN. 22% participants had suffered from one of the complications in the past; most commonly haemorrhagic stroke.

23% participants were on combination therapy (more than one tablet). 62% participants did not know the name of tablets prescribed. 40% participants did not take all the prescribed medications regularly. 48% participants were unaware that they have to take medications regularly for lifetime. 8% participants often stopped taking medications because they feel sick due to effects of medications. 38% participants often forget to bring their medication when they travel away from home. 48% participants run out of medication at home; mostly because they cannot afford the medication.

56% participants were non-adherent to the treatment (Medication Adherence Scale ≤ 22). 40% participants often decide not to take medication; mostly because they started disliking them. 40% participants often decide to take less medications without consulting the physician; as they feel their blood pressure is under control.

97% participants strongly felt that their knowledge about the hypertension & its complications will improve their adherence to the treatment.

Table III: Awareness regarding the treatment.		
No. of Tablets	1 tablet >1 tablet	79 21
Do you feel reducing the number of tablets improve adherence to treatment?	Yes No	81 19
Do you take all prescribed medications regularly?	Yes No	60 40
Are you aware that you have to take medications for lifetime unless stopped by your doctor?	Aware Unaware	52 48
Are you aware of the consequences of stopping medications suddenly?	Aware Unaware	40 60
Have you been told to make life style modification?	Yes No	87 13
Do you take alternative medication for control of HTN (other than allopathy)?	Yes No	09 91
Do you think awareness about the disease & the complications will improve the adherence to treatment?	Yes No	97 03

Regarding the adherence

1. How often do you forget to take your medication?
2. How often do you decide not to take medications?
3. How often do you decide to take less of your medications?
4. How often do you stop taking your medications because you feel sick due to effects of the medications?
5. How often do you forget to bring your medicine when you travel away from your home?
6. How often do you not take medications because you run out of medication at home?

Each question had a four-point Likert-type response format, each response carrying a score: None of the time = 4, Some of the time = 3, Most of the time = 2 and All of the time = 1
Adherence score

Figure 1: No. of patients adherent to the treatment

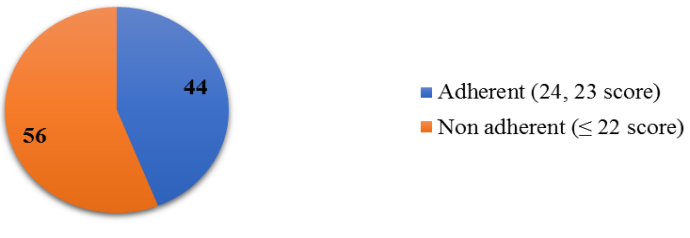

Table IV: Factors affecting the adherence.		
Why do you decide not to take medications?	I started disliking them I forgot to take them Others*	27 04 09
Why do you decide to take less of your medications?	I feel I am free of the disease I feel less treatment is enough Others#	24 08 08
Do you consult your physician if stop taking your medications because you feel sick due to effects of the medications?	I do consult my physician once I feel them I don't consult my physician at that time	07 01
How often do you forget to bring your medicine when you travel away from your home?	Never Sometimes Most of the times	62 20 18
Reasons you run out of medication at home?	Can't afford Not easily available Forgot to buy	23 03 12

Others*: I take alternate medicine (2), feel free of disease (3), feel better (2), doesn't feel like going & buy (laziness) (2)
Others#: Feel should be free of medications (3), tired with lots of tablets (4), workload (1)

DISCUSSION

Increased knowledge about the disease promotes the compliance of the patients with prescribed medications. However nonadherence to the treatment remains a major issue in various chronic diseases including hypertension. In this study we attempted to identify factors related to nonadherence to antihypertensive medication which would have wide generalizability.

In our study, we observed that 56% of the patients were having uncontrolled BP at the time of survey. Uncontrolled systolic and diastolic BP are important risk factors for increased cerebrovascular events, cardiovascular events, and all cause mortality. In our study we found that almost 80% of the patients with uncontrolled hypertension were nonadherent to the treatment, Egan BM in his study observed that more than 50% of the uncontrolled hypertensive patients have suboptimal adherence.[11]

It is important to regularly check the BP so as to adjust the doses of the drugs. In the study, 48% of the patients were checking their BP monthly. And a huge no, 40% of the patients check their BP once in every 4-5 months, 9% of whom used to check it rarely. This result is similar to the various studies conducted in the past.[11] This could be due to not knowing consequences of uncontrolled HTN.

Lack of medication adherence in hypertensive patients is a significant concern. Significant number (45.2%) of the hypertensive patients are nonadherent to antihypertensive medications and nearly one-third (31.2%) of hypertensive patients with various comorbidities showed nonadherence to medications in various studies. In our study we found a substantial number of patients (56%) were not adherent to the treatment.

When asked about how often they take less medication and why, it was seen that 40% of the patients decide to take less medication than prescribed on their own without consulting the physician. 27% of these, had started disliking the treatment. 24% of the patients thought that they are free of the disease, 8% of the patients felt that less medication should be enough to control their hypertension. Rest felt better without the treatment and some preferred alternate therapy over allopathic medicine.

In our study we found that 10% of the patients had stopped medication due to side effects of the drugs. This observation goes in line with a German study where the second most common reason for non-compliance with antihypertensive therapy was adverse effects.[12]

32% of patients forget their medicines while on travel out of which 18% forget quite frequently. Cost is a crucial issue in patient's compliance especially for patients with chronic disease as the treatment period could be life-long.[13,16] We found that 65% of the patients who run out of medicines at home, alarming 23% cannot afford the treatment. So financial status of the patient should be taken into consideration while deciding pharmacotherapy. This could be achieved by prescribing generic drugs to these patients.

Considering all the above factors, percentage of adherence found in our study was 56% which is comparable with Carrea et al study (57%) where he assessed the antihypertensive medication adherence using MMAS-8 items and urine fluorescence in resistant hypertensive patients.[17] Our reasons for nonadherence to antihypertensive medication are multifactorial, several studies have found out association between nonadherence and various factors like patients' identification of socioeconomic condition, education standard and cultural background and others.[18,22]

In Pakistan, only 0.8% of hypertensive patients claimed that they had adequate knowledge about HTN.[11] A higher compliance rate was observed in a study done in India and a study done in Kuwait, where it was 78.7% and 88.6%, respectively.[23,29] All these data indicate that patients in developed countries have more knowledge about HTN compared to people in underdeveloped or developing countries. It means that there may be a correlation between industrialization level and awareness for HTN.

Identification of these factors and sharing the same with the health professional could help in improving adherence, reduce cost, optimize drug therapy and thus achieve better blood pressure control.

97% of the patients strongly feel that their knowledge about the disease and its complications will surely help in improving compliance and hence adherence.

This shows that spending more time in counselling can go a long way in improving adherence to the treatment. Many past studies have proved that too little time spent with patients was also likely to threaten patient's motivation for maintaining therapy.[30,34]

Surprisingly 74% of the patients were not aware of the normal BP. 91% of patients were not aware of the hypertensive range of BP. 40% of the patients check their BP irregularly, once in 4-5 months, 9% of them, check it rarely. In our study, we noticed strong association between level of education and their awareness about importance of getting their BP checked regularly.

As far as their knowledge about complications of uncontrolled hypertension goes, substantial, 50% of the patients were not at all aware of any such complication. 55% of the patients were not told about consequences of uncontrolled HTN by their physician. 22% of them already suffered from some or other complication during their lifetime.

48% of patients were not known that the treatment for the hypertension will have to be continued lifelong unless told by their doctor to stop the medication. 58% of the patients were not aware of the consequences of the sudden stoppage of antihypertensive medication.

A comprehensive strategy for reduction in complications, thus mortality and morbidity due to hypertension, must include prevention strategies, increased awareness, early detection, adequate treatment with strict adherence to it and thus ensure a good control of blood pressure. This can be achieved only if the general public is aware of the presenting features of HTN, importance of adherence to the treatment for preventing its complications. Hypertension is a multifactorial disorder but any individual risk factor can contribute to overall increase in blood pressure.

CONCLUSIONS

Increase in morbidity and mortality due to uncontrolled hypertension in recent years diverted researchers' attention to find out level of adherence to antihypertensive medications and the factors responsible for nonadherence. According to results of our study substantial, 56% of patients are non-adherent to the treatment. 97% of the patients feel that their knowledge about the disease and its complications, their awareness about the consequences of nonadherence to the treatment will surely help in improving adherence to the treatment. Through this study, we identified areas of importance that need to be considered by awareness programs to improve adherence to the treatment in hypertensive patients. Masses should be educated on the risk factors, presenting features and complications of hypertension. This is possible through awareness programs designed by health professionals and the government.

Practice implications

- Starting a Hypertensive OPD for education of patients regarding complications of uncontrolled hypertension and importance of adherence to the treatment
- Counselling and awareness session conducted by Physician, Pharmacologist and Dietician
- Distribution of pamphlet among the hypertensive patients visiting the OPD; highlighting the Do's and Don'ts for adherence to the treatment

Conflicts of interest

We wish to confirm that there are no known conflicts of interest associated with this publication and there has been no significant financial support for this work that could have influenced its outcome.

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