



IMPACT OF MEDICATION ADHERENCE IN HYPERTENSIVE PATIENTS IN RURAL POPULATION OF GUNTUR DISTRICT IN SOUTH INDIA

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ABSTRACT

Aim and Objectives: To study and assess the impact of medication adherence in patients suffering from hypertension.

Methodology: A prospective observational cohort study was conducted for a period of 6 months in a rural area of Guntur. A total of 300 hypertensive patients who were newly diagnosed or suffering from hypertension since 3 years were recruited. Blood pressure was measured by using a sphygmomanometer and other demographics were collected. Medication adherence was assessed using the HILL-BONE compliance to high blood pressure therapy scale (HILL-BONE CHBPTS).

Results: Hill-Bone scores were analyzed in the aspects of medication compliance, salt usage, appointment keeping and observed a modest improvement in all aspects with an average of 8.49.

Conclusion: Proper treatment and awareness about medication and their usage will improve medication adherence. Good medication adherence not only improves the clinical outcomes, it is also having a great impact on improving the quality of life and reducing health care costs which are due to complications and co-morbidities of hypertension. Clinical pharmacists play a vital role in improving the adherence by providing periodic counselling, which in turn helps to reduce the burden of illness.

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INTRODUCTION

Hypertension is one of the most common chronic diseases affecting humans and is a major risk factor for stroke, myocardial infarction, vascular disease, and chronic kidney disease. Due to the associated morbidity a mortality and cost of disease to society, preventing and treating hypertension is an important public health challenge now-a-days. Modern life is full of hassles, deadlines, frustrations and demands. Mental stress or psychosocial stress is one of the major risk factor for hypertension, which in turn is the risk factor for various other cardiovascular diseases.^[1] Adherence is referred as "active, voluntary, and collaborative involvement of the patient in a mutually acceptable course of behavior to produce a therapeutic result. Adherence and compliance are often interchangeable synonymous terms. In patients with hypertension, adherence to medication is critically important for controlling blood pressure and reducing associated risk of cardiovascular complications.^[2] Compliance consists of three components, namely, acceptance of medication prescribed, adhering to it and continuing with it. Thus compliance is a complex and dynamic health enhancing behavior that involves

acts of appointment keeping, obtaining and ingesting medications and persisting with a health provider. Compliance with treatment at the individual level improves the quality of life by preventing complications and thereby premature death.^[3] There is a positive relationship between levels of adherence and knowledge regarding treatment. When patients have positive beliefs regarding the efficacy of their treatment and also trust that their medication is working well to control their illness, their adherence often improves.^{[6][12]}

In the rural areas most of the people are illiterate and lack awareness on condition and medications. Some of the barriers include poor provider-patient communication, inadequate knowledge about a drug and its use, not being convinced of the need for treatment, fear of adverse effects of the drug, long term drug regimens, complex regimens that require numerous medications with varying dose schedules, cost and access barriers. Adherence to therapies is a primary determinant of treatment success. Failure to adhere is a serious problem which not only affects the patient, but also the health care system.^[4] Patient counseling was provided verbally either to patients or to their representatives regarding directions of medication

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use, advice on side effects, storage, diet and lifestyle modifications. It involves a one-to-one interaction between a pharmacist and a patient and/or a caregiver. An effective counseling should encompass all the parameters to make the patient understand his/her disease, medications and lifestyle modification required.^[5]

Aim And Objectives: To study and assess the impact of medication adherence in patients suffering from hypertension.

MATERIALS AND METHODS

Prospective Observational Cohort Study conducted from December 2016 to May 2017. This study was conducted in a rural area of Guntur district. People recently diagnosed with Hypertension & who were suffering from hypertension since 3 years Were identified and purpose of study was explained and informed consent was obtained. Patients were counselled about the disease, lifestyle modifications, use of antihypertensive medication and were provided with patient information leaflet which was validated by the medical experts. Patients with chronic complications, pregnant women, disabling diseases were not included. In the study total 300 patients were included. Hill-Bone compliance to high blood pressure therapy scale (HILL-BONE CHBPTS) was used to assess medication adherence level in this study. HILL-BONE CHBPTS consisted of 14 questions/items having 3 subscales under behavioral domains of hypertension treatment which included 1) Medication adherence 2) Reduced salt intake and 3) Appointment keeping. Each question/item was answered with a four-point Like scale ranging from 1 to 4 (1= none of the time, 2 = some of the time, 3 = most of the time, and 4 = all the time). Total HILL-BONE CHBPTS score ranged from 14 (perfect adherence) to 56 (non-adherence) with higher scores denoting overall poorer adherence.^[2] In Hypertensive patients, blood pressure (systolic and diastolic in mm of Hg) was recorded with manual mercury sphygmomanometer using an appropriate sized cuff. After 10 minutes of rest, blood pressure was recorded in sitting position, with their feet on the floor and arms supported at the level of the heart.^[2]

Statistical Analysis: Data recorded was entered in Microsoft excel 2007. Statistical analysis was done using Graphpad Instat 3.0. Student ‘t’ test was used for the comparison of the data. All the values were expressed in actual number, percentage, and mean±standard deviation. Probability “P” value of less than 0.05 was considered as statistically significant.

RESULTS

Table 1 Baseline characteristics of sample population

Parameter	Value
Patient with hypertension	300
Mean age (years)	58.12
Males	87(29%)
Females	213(71%)
Mean Systolic blood pressure (SBP) in mm of Hg	146.8±14.36
Mean Diastolic blood pressure (DBP) in mm of Hg	91.66±9.09
Mean Hill-Bone score	29.42±5.63

A total of 300 samples were recruited with a mean age of 58.12 years and it is observed that the female population (71%) was more when compared to the male population (29%). Mean systolic and diastolic blood pressure at the initiation of the study was 146.8 and 91.66 respectively. The Mean Hill Bone score was 29.42.

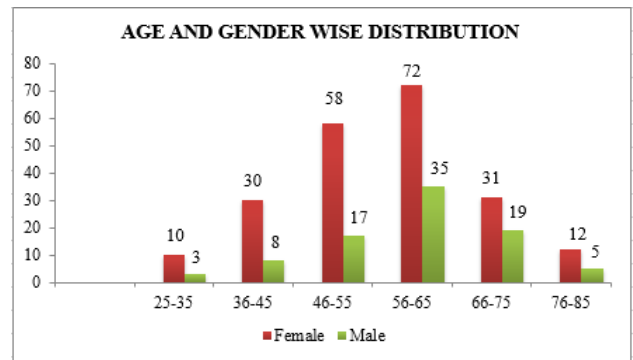


Figure 1 Age and gender wise distribution of sample population

By reviewing all the demographic data among 300 subjects, most of the members 107(36%) aged between 56-65 years were suffering from hypertension with female predominance 72(24%).

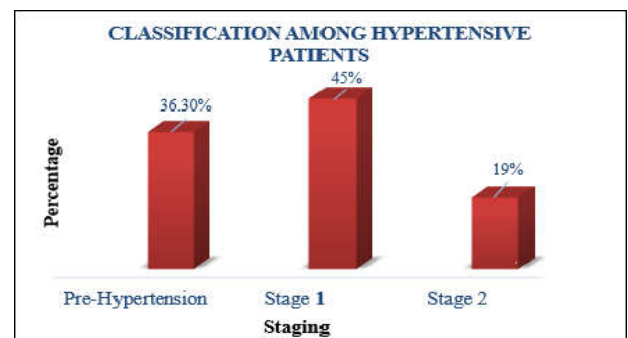


Figure 2 Staging of sample population based on JNC8

Among the sample population, 45% are in stage-1 hypertension followed by 36.30% are in the pre-hypertension stage and 19% are in stage-2 hypertension.

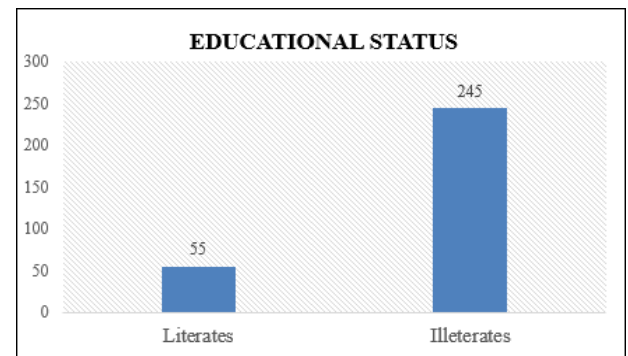


Figure 3 Educational status of sample population

Figure-3 depicts the educational status of sample population where 18% are literates and 82% are illiterates. The percentage of literate sample was much less than that of illiterate as the study was conducted in a rural community setting.

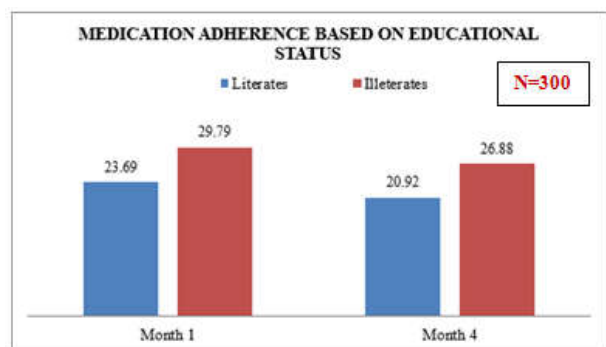


Figure 4 Medication adherence of sample population based on educational status

Comparing the educational status with adherence, literates were found to be less adherent than illiterates with a mean difference of 2.77 in literates and 2.91 in illiterates.

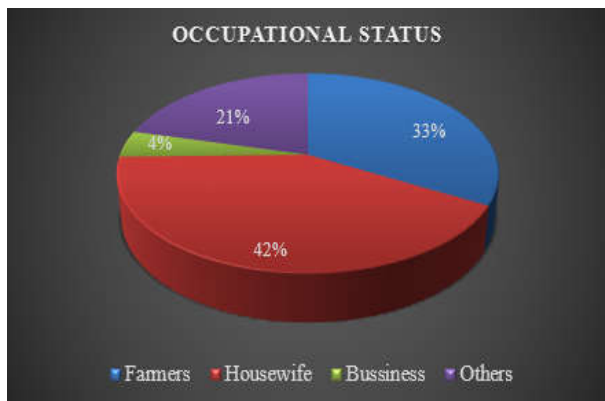


Figure 5 Occupation status of sample population

According to the occupational status, mostly Housewives (42%) were suffering with hypertension when compared to other occupation.

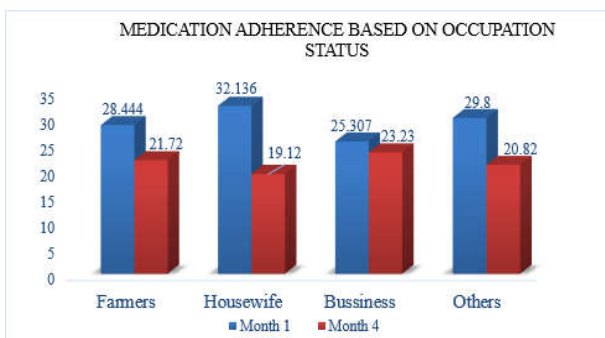


Figure 6 Medication adherence of sample population based on occupation status

Among 300 sample population Housewives were more adherent to therapy with a mean difference of 13.01, followed by Farmers (6.72), Business people (2.07) and others (8.98).

Table 2 Scores of different domains of Hill Bone scale during the study

Parameter	Month-1 (Mean± SD)	Month-2 (Mean± SD)	Month-3 (Mean± SD)	Month-4 (Mean± SD)	'P' Value
Compliance	15.34±3.7	13.97±3.2	12.77±2.60	9.9±1.7	<0.05
Salt usage	6.56±1.61	5.88±1.42	5.30±0.98	4.29±0.93	<0.05
Appointment keeping	7.58±1.93	7.34±1.58	7.17±1.40	6.65±1.21	<0.05
Total score	29.42±5.63	27.23±4.51	25.34±3.62	20.93±2.95	<0.05

*P value <0.05 considered significant (Paired student t-test- Two Tailed)

Table 3 Comparison of different objective parameters during the study

Parameter	Month-1 (Mean± SD)	Month-2 (Mean± SD)	Month-3 (Mean± SD)	Month-4 (Mean± SD)	'P' Value
Systolic Blood pressure	146.8±14.36	143.15±12.38	139.11±10.72	135.6±8.49	<0.05
Diastolic Blood pressure	91.66±9.09	90±8.10	87.43±7.15	86.53±5.66	<0.05
Total Hill-bone score	29.42±5.63	27.23±4.51	25.34±3.62	20.93±2.95	<0.05

*P value <0.05 considered significant (Paired student t-test- Two Tailed)

DISCUSSION

Adherence to the treatment is essential to avoid complications of the disease progression.^{[7][8]}

A total of 300 patients were enrolled, out of which 29% were male and 71% were female. This is comparable to a study performed by Bhusal A, Jadhav PR, *et al.*, in hospital settings (n=129), where the female population was more (52.2%) compared to the male population.^[2]

The mean systolic blood pressure of sample population was 146.8±14.36 mm of Hg and diastolic blood pressure was 91.66±9.09. This result is similar to the study conducted by Bhusal A, Jadhav PR, *et al.*, where the mean systolic blood pressure was 140.10±14 mm of Hg and diastolic blood pressure was 90.12±8.9 mm of Hg.^[2]

The present study (n =300), 45% patients are in stage 1 hypertension and 19% patients are in stage 2 hypertension. Which is comparable to study was conducted by Kaliyaperumal S, Hari SB, PrasanthKumarS, *et al.*, 54.6% patients are in stage 1 hypertension and 45.3% are in stage 2 hypertension.^[9]

The present study showed a definite correlation between literacy rate and adherence. 61.8% literate population of our study were adherent to therapy, whereas only 35.1% illiterate were adherent. This is similar to Johnson AB, *et al.*, study, where literates (92%) were more adherent compared to illiterates (83%). The number of illiterates in our study was more owing to the fact that our study was performed in a rural community based setting.

The present study employed Hill Bone scale for calculating adherence. Various other studies (Bhusal A, Jadhav PR, *et al.*, Dr. Awad YE, Dr. Gwaied VE, Fouda LM, *et al.*) also used the same scale for calculating adherence. Our study was performed over a period of 6 months with a 4 follow-ups monthly. Score of compliance levels and salt usage in the follow up were 9.9±1.7 and 4.29±0.93 respectively, which were comparatively lesser than the score of compliance levels and salt usage in a study by Bhusal *et al.*, 14.62±2.11 and 5.67±1.12 respectively. Appointment keeping aspect of the scale, however, was better in their study (5.27±0.93) compared to our study (6.65±1.21). This may be attributed to the fact that being a part of the rural community, the economic status and transportation availability of the patients in our population was significantly lower. Over the course of the study, a significant improvement ('P' value <0.05) was observed in the study population in regards to adherence from the first follow up (29.42±5.63) to the fourth follow up (20.93±2.95) (Bhusal A, *et al.*, 2016). By providing periodic patient counseling, it was found that there was significant improvement in medication adherence.

CONCLUSION

Adherence to medication regimen is an important factor for optimal clinical benefit in chronic conditions like hypertension. Proper treatment and awareness about medication and their usage will improve medication adherence. Good medication adherence not only improves the clinical outcomes, it is also has a great impact on improving quality of life and reducing health care costs which are due to complications and co-morbidities of hypertension. But the study needs to be conducted for longer period with a huge sample size to establish impact of adherence on disease progression.

Conflict of interest: The author(s) declare(s) that there is no conflict of interest regarding the publication of this article.

Limitations

Our study used Hill-Bone scale to measure adherence which is a self-reporting scale and therefore, the chance for recall bias is magnified. Our study also did not include adherence level comparison between controlled hypertensive group and uncontrolled hypertensive group. Our study was conducted in short time period therefore findings cannot be generalized in a community based settings. Another limitation of our study was that awareness of complications and impact of complications on patient mental health and physical health was not studied.

Abbreviations

BP- Blood Pressure
CHBPTS- Compliance to High Blood Pressure Therapy Scale
DBP- Diastolic Blood Pressure
JNC-8- Eighth Joint National Committee
QOL- Quality of Life
SBP- Systolic Blood Pressure
SD- Standard Deviation

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