A cross-sectional study on the compliance to antihypertensive drugs in a rural area

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ABSTRACT

Background: The burden of the non-communicable diseases (NCDs) is increasing over the years. Worldwide, the leading cause of morbidity and mortality has been due to NCDs. Although NCDs are multifactorial, hypertension plays a major role as a risk factor. Lack of treatment adherence can lead to negative health consequences. **Objectives:** The objectives of the study were as follows: (1) To assess patients' compliance to antihypertensive drugs; (2) to evaluate association between treatment compliance and sociodemographic determinants; and (3) to find out the factors responsible for non-adherence. **Materials and Methods:** This study was carried among 350 hypertensive patients in the rural field practice area of a medical college using simple random sampling method. The study population consists of hypertensive patients belonging to 20–60 years of age. A pretested structured questionnaire containing Morisky's scale was used to assess patient's adherence. Data analysis was done using SPSS (Version 22). **Results:** Nearly 53.7% of the study participants were female. The prevalence of treatment compliance was estimated to be 24.6%. Statistically significant association was observed between age, education, and socioeconomic status with adherence to hypertensive medications ($P < 0.05$). Many reasons were identified for non-adherence and they include cost of treatment (21.4 %), side effects (27.5%), alternative treatment (16%), lack of knowledge (32.8%), and multiple drugs (25%). **Conclusion:** The prevalence of 23.6% of patient's being adherent to hypertensive medications was observed among the study population. It is necessary to strengthen treatment adherence by various health education campaigns and implementing various health programs.

KEY WORDS: Adherence; Treatment; Morisky

INTRODUCTION

Non-communicable diseases (NCDs) are chronic diseases that are not communicable in nature. Usually, NCDs are diseases affecting individuals over an extended period of time causing socioeconomic burden.[1] The burden of the NCDs is increasing over the years and currently they are the leading cause of mortality and morbidity in the world. The four main types of NCDs include cardiovascular diseases, cancers, chronic respiratory diseases, and diabetes.[2]

Around 15 million people at the age of 30–70 are affected due to NCDs each year. According to the World Health Organization,[3] mortality rate in India due to NCDs is 61% and nearly 23% of the population are at risk of premature deaths.[4] In India, almost 40% of those diagnosed with NCD are subjected to institutional treatment while 35% are treatment on outpatient basis.[5]

NCDs claim to be the biggest killers in the world, of which hypertension is the third leading cause of death in the world. Hypertension being a vital risk factor for cardiovascular diseases (CVDs),[6] is modifiable if diagnosed, treated, and adhered. One in eight deaths is due to hypertension worldwide.[7] Often, hypertension is diagnosed as an accidental finding either when checked before a surgical procedure or when admitted for other reasons. Most of the times medical attention is sought only after any organ damage

have occurred. Therefore, it is mandatory to know the BP status and its importance in early diagnosis, prompt treatment, and adherence.[8] In 2015,worldwide burden of hypertension is observed to be 1.13 billion. Global prevalence is estimated to be 40%, India and Tamil Nadu holds prevalence of 29.8% and 19.1%, respectively.[9,10]

According to the WHO, adherence is defined as the degree to which the person's behavior corresponds with the agreed recommendations from a health-care provider. Inadequate adherence to treatment can lead to serious health consequences in future. Factors such as socioeconomic status, education, patient memory, level of awareness, type of treatment, and duration may affect patients compliance to treatment. Adherence to medication is an important factor that determines the adequate management and control of hypertension.[11]

Studies on adherence to medication are lacking in rural Tamil Nadu and hence this study was planned with the objective of estimating the prevalence of patients' compliance to antihypertensive drugs. In addition, various risk factors were estimated and association was analyzed.

MATERIALS AND METHODS

Study Design

This study is a community-based cross-sectional descriptive study.

Study Area

This study was conducted in Serapanancheri, which is the rural field practice area of Sree Balaji Medical College and Hospital in Kancheepuram district.

Study Period

The study period was 6 months (August 2018–January 2019).

Study Population

The study population includes patients diagnosed with hypertension for more than 6 months and those who stay in selected study area.

Inclusion Criteria

The following criteria were included in the study:
- All hypertensive patients who have consented to take part gave in the study
- Patients diagnosed with hypertension for at least minimum of 6 months and those on antihypertensive drugs for at least 6 months.

Exclusion Criteria

- Study subjects who were unwilling to take part in the study were excluded from the study
- Mentally retarded and bedridden patients were excluded from the study.

Sample Size

Sample size was calculated from a study conducted in 2015 by Venkatachalam *et al.*[12] in Kancheepuram, Tamil Nadu. From this study, the prevalence of treatment compliance was observed to be 2.1%. Sample size was calculated using formula $4pq/l^2$ in which p value was taken as 24.1, q as 75.9, l as 5 with 95% confidence interval, precision 10%, and 10% non-response. With this, sample size was rounded off to 350.

Sampling Method

Among 600 hypertensive patients who were registered in field practice area, 350 hypertensive patients were selected as study subjects by simple random sampling method using computer generated random number tables.

Study Tool

Pre-tested structured questionnaire was used. Questionnaire consisted of sociodemographic determinants including age, sex, education, occupation, and marital status which were collected. In addition, details regarding treatment compliance and Morisky's 4-item scale were used.

Data Analysis

Data entry was done in MS excel. Data were analyzed using SPSS software version 22. Data were presented using descriptive and analytical statistics. Chi-square test and estimation of *P* value were done to calculate statistical association.

Informed Consent

At the start of study, informed consent was obtained from all respondents.

Ethical Clearance

Ethical proposal was presented before the Institutional Ethical Committee (IEC) and approval was obtained before conducting the study.

RESULTS

Data collected and analyzed are represented in form of tables and graphs. Table 1 shows the sociodemographic characteristics of the study respondents. Majority of the study respondents belonged to 40–59 years of age (51.2%). Among

Table 1: Sociodemographic characteristics of respondents

Characteristics	Frequency (*n*=350)	Percentage
Age		
20–39	71	20.2
40–59	179	51.2
60–79	90	25.8
More than 80	10	2.8
Sex		
Male	162	46.3
Female	188	53.7
Marital status		
Married	302	86.5
Unmarried	17	5.1
Widow	31	8.4
Education		
Illiterate	18	4.9
Primary education	108	30.9
Middle school	85	24.4
High and higher secondary	70	20
Graduate	33	9.3
Postgraduate	36	10.5
Socioeconomic status		
Upper class	32	9
Upper middle	37	10.6
Lower middle	108	30.9
Upper lower	83	23.7
Lower class	90	25.7
Family history		
Yes	135	38.6
No	214	61.4

the study participants, majority were female (53.7%) and the remaining 46.3% were male. Nearly 86.5% of the respondents were married. Among the study participants, 30.9% had completed up to primary school, 24.4% completed middle school, and around 20% had done up to high school education. Socioeconomic class was assessed using BG Prasad scale. Almost 30.9% of respondents belonged to lower middle class and 25.7% were from lower class. Nearly 38.6% of the respondents had a positive family history of hypertension.

Figure 1 depicts level of compliance of patients to antihypertensive drugs. Of the 350 respondents, only 86 (24.6%) of them were adherent to treatment, whereas 264 (75.4%) patients were not adherent to the treatment.

Various reasons for non-adherence are depicted in Figure 2 they are. Cost of treatment (21.4 %), side effects (27.5%), alternative treatment (16%), lack of knowledge (32.8%), and multiple drugs (25%) are the main reasons for non-adherence identified in this study.
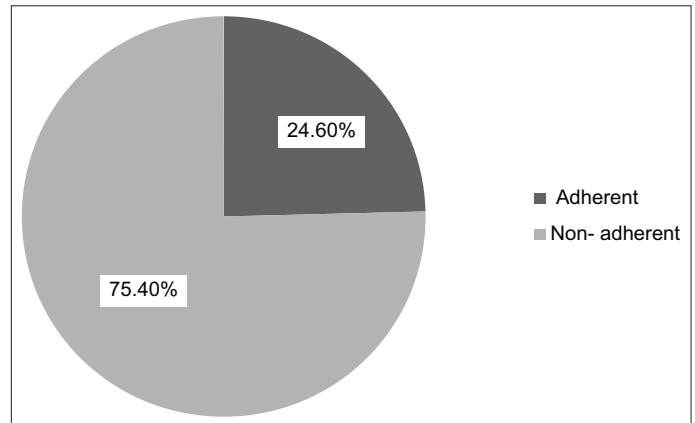

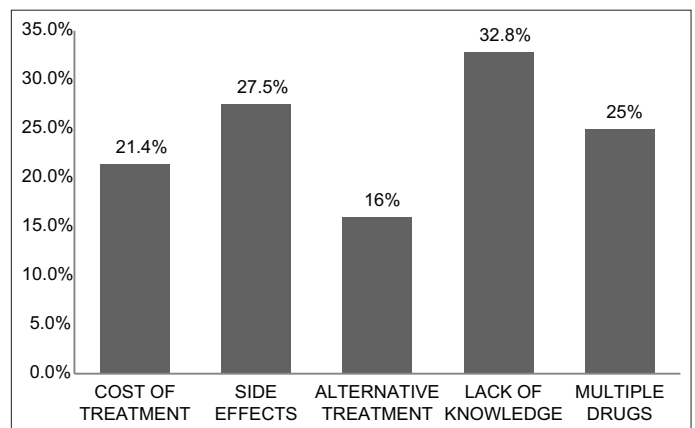**Figure 1:** Adherence to antihypertensive medication

Figure 2: Reasons for non-adherence

Association between sociodemographic factors and treatment compliance is shown in Table 2. Statistically significant association was observed between factors such as age, education, and socioeconomic status with adherence to antihypertensive medications. As the age increases, the adherence percentage decreases. Adherence is more in educated and non-adherence is more in the lower socioeconomic status. There was insignificance present between sex and duration of hypertension and compliance to antihypertensive drugs. From this study, it is estimated that majority of the participants (72%) had poor control over their blood pressure, while the remaining 28% had adequate control.

Table 3 shows the association between patients' treatment compliance and the control of hypertension. Statistically significant association was observed between compliance and control of hypertension ($P < 0.0001$).

DISCUSSION

The prevalence of adherence to hypertensive treatment among the study participants in this study was estimated to be 24.6%. This was compared with a similar study conducted in

Table 2: Factors associated with sociodemographic factors on patients' overall compliance to antihypertensive drugs

Sociodemographic determinants	Compliance (86) (%)	Non-compliance (264) (%)	Chi-square	*P* value
Age				
<60	51 (59.3)	193 (73.1)	22.119	0.000*
>60	35 (40.7)	71 (26.9)		
Sex				
Male	36 (41.8)	126 (47.8)	0.898	0.343
Female	50 (58.2)	138 (52.2)		
Education				
<High school	40 (46.5)	165 (62.5)	5.854	0.015*
≥High school	46 (53.5)	99 (37.5)		
Duration (years)				
<5	35 (40.6)	117 (44.3)	0.346	0.556
>5	51 (59.4)	147 (55.7)		
Socioeconomic status				
Upper class	44 (51.2)	25 (9.5)	71.243	<0.0001*
Lower class	42 (48.8)	239 (90.5)		

*P<0.05, statistical significance

Table 3: Association between compliance and hypertension control

Variable	Adherent (86)	Non-adherent (264)	Chi-square	*P* value
Hypertension control				
Yes (98)	65	33	128.040	<0.0001
No (252)	21	231		

Kancheepuram district by Venkatachalam *et al.*, in which the prevalence was recorded as 24.1%.[12] Another similar study conducted by Kamran *et al.* in Malaysia recorded prevalence of 24%.[13] In a study by Hema and Padmalatha, the adherence to medication is 15.3%.[14] All these above-mentioned studies were found to have lower prevalence when compared to a study done by Hadi in Iran, where compliance to treatment was estimated to be 48.7%.[15] Probable reason for this gross variation would be because of various factors influencing sociodemographic characteristics among countries. From our study, it is noted that non-adherence to antihypertensive treatment was estimated to greater among females (52.2%) and as the age increases, the adherence percentage decreases. Adherence is more in educated and non-adherence is more in the lower socioeconomic status. In a study done by Venkatachalam *et al.*, non-adherence is more in females (51.3%) and as the age increases, the adherence percentage decreases.[12] Ahmad did a study in North India in which compliance to hypertensive treatment was estimated to be higher among men when compared to women. Very minimal adherence was noted among smokers and alcoholics.[16]

Major reasons given by respondents for not adhering to treatment were as follows: Cost of treatment (21.4%), side effects (27.5%), alternative treatment (16%), lack of knowledge (32.8%), and multiple drugs (25%). Dennis *et al.*[17] did a study in which the

reasons for non-adherence identified are Belief (39.14%), lack of access to drugs (82.57%), recall (62.17%), cost of treatment (78.62%), and lack of drug availability (54.93%). In another study by Srivastava *et al.*, cost (40%), fail to remember the dose (28%), and prolonged span of treatment (27%) were factors for non-adherence.[18] In this study, there is a statistical significance (*P* < 0.001) between adherence to medication and the control of hypertension. It is similar to the studies by Ahmad[16] and Yiannakopoulou *et al.* where adherence is the significant factor associated with control of hypertension.[19]

Strength and Limitations

The present study holds few limitations. Being conducted among rural area, the current study could not include hypertensive patients from urban community. For this reason, results cannot be generalized to all hypertensive patients. Investigation on many determinants of compliance was not possible. Chance of recall bias was higher due to self-reporting which could have been either due to overreporting or underreporting depending on patient's behavior on the recent past. However, the researcher was clarifying the questions when asking participants. The study was quantitative descriptive cross-sectional design conducted using questionnaires which consisting of closed-ended questions that the subjects answered research questions to achieve the research purpose and aim; thus, the researcher explained clearly to the study subjects every question in local language so that they were able to understand and respond.

RECOMMENDATIONS

Poor adherence to medication leads on to inadequate control of hypertension. Implementation of various programs and

activities focusing on various factors that were found to be statistically associated with treatment non-adherence could be made necessary so than compliance to antihypertensive treatment can be strengthened to a greater extent. Health education plays a key role in improving awareness and sensitizing our community regarding this issue. Regular counseling and motivation by the treating physician to develop tendency to adhere to antihypertensive treatment at grass root level itself is important. IEC and BCC methods can be adopted to improve the knowledge and to bring about a change in the behavior to curb this problem.

CONCLUSION

From our current study, very low prevalence (24.6%) was observed of patient's being adherent to hypertensive treatment. Statistically significant association was noticed between various sociodemographic determinants and treatment non-adherence. This necessitates the need to improve the level of adherence in the population to prevent complications due to hypertension. Health-care providers need to focus on health educational intervention so that patients can realize the complete benefit of treatment. In addition, continuous support should be provided to achieve long-term adherence, thereby ultimately minimizing negative health outcomes.

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