

A Study to Assess the Impact of Comorbidities and Polypharmacy in Non-Adherence to Antihypertensives

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ABSTRACT

Hypertension is one of the most commonly treated cardiovascular risk factors and has been identified as a high-risk condition for adherence to therapy. Many patients fail to adhere to the prescribed treatment possibly due to the asymptomatic and lifelong nature of hypertension.

The present study was aimed to evaluate the relation of comorbid conditions and polypharmacy associated with hypertensive patients who are non-adherent to antihypertensive drugs. It also aims to address patient compliance for the medications provided to them. This is a cross-sectional prospective community based study conducted in Mangalore; Karnataka involved 150 patients diagnosed with hypertension and on oral antihypertensive agents. Patients' age, sex, comorbid conditions, concomitant medications and level of polypharmacy were assessed in the present study. Comparing medication adherence in both the groups i.e. group of subjects with only hypertension and the group of subjects with other co morbid conditions, the study outcome suggests that people with only hypertension were found to be much more adherent than those with co morbidities. The results also show that 10.6% of the study population had poly pharmacy and that none of the patients with poly pharmacy were high adherent to the therapy.

The present study concludes that comorbidity and polypharmacy among hypertensive patients had interfered in achieving medication adherence.

Keywords: Hypertension, Antihypertensives, Medication adherence, Comorbidities, polypharmacy.

INTRODUCTION

Medication adherence is defined as “the degree to which the person's behavior corresponds with the agreed recommendations from a health care provider” [1] and hypertension, also known as high or raised blood pressure, is a condition in which the blood vessels have persistently raised pressure. It is one of the most commonly treated cardiovascular risk factors and has been identified as a high-risk condition for adherence to therapy. Hypertension is a serious medical condition and can increase the risk of heart, brain, kidney and other diseases. It is a major cause of premature death worldwide, with upwards of 1 in 4 men and 1 in 5 women – over a billion people – having the condition.

The most common type of hypertension is essential or primary hypertension. Secondary hypertension is a result of the underlying co morbid conditions such as endocrine defect, kidney disease or tumors. If those underlying issues are corrected, blood pressure could return to normal values. [2] Despite several studies supporting the protective effect of antihypertensives on cardiovascular morbidity-mortality, many patients fail to adhere to the prescribed treatment, mainly due to the asymptomatic and lifelong nature

of hypertension. Furthermore, poor adherence to antihypertensive medication has been shown to result in poorer rates of blood pressure control, as well as increases in healthcare utilization and overall health expenditure. [3]

Hypertension can be associated with several comorbid conditions, thus, often, hypertensive patients are prescribed multiple drugs. Although multiple drugs help to combat various diseases, they also increase the propensity of drug interactions and adverse drug reactions. The present study thus tries to evaluate the comorbid conditions and polypharmacy associated with hypertensive patients who are non-adherent to antihypertensive drugs. It also aims to address patient compliance for the medications provided to them.

MATERIALS & METHODS

Study Design: A prospective cross sectional study to assess the role of comorbidities and polypharmacy in non-adherence to antihypertensives.

Study Site: The present study was conducted among the individuals in Kankanady, Valachil, Valencia, Jeppu and Padil of Mangalore in Karnataka

Study Duration: The study was conducted for duration of 6 months from September 2019 to March 2020.

Sample Size: The study was limited for a sample of 150 patients based on the time schedule allotted for the project including other circumstances.

Ethical clearance: The ethical clearance for the study was obtained from the institutional Human Ethics Committee of Srinivas Institute of Medical Sciences and Research Centre, Mukka, Mangalore (Ref no. 2019/10/2820/1 dated 31.10.2019)

Study criteria:

Inclusion criteria:

- Patients of age 31-90 years of either sex with hypertension
- Patients on oral antihypertensive agents.
- Patients who are willing to participate in the study

Exclusion criteria:

- Patients with visual and hearing impairment
- Pregnant and lactating women
- Terminally ill patients
- Patients <18 years or >70 years
- Patients who did not agree to participate in the study

Source of data:

Data (s) for the study were collected using data collection form subjects. Area – wise they were distributed from different parts of Dakshina Kannada district. The data was collected through direct interaction with the patients.

Study method:

Preparation of informed consent form (ICF)

Informed consent form was prepared in Kannada and English and the same was used. Before selection of subjects, the consent form was orally explained to the participants before filling it and verbally and made they understood. In the study only the participants willing to fill ICF were included.

Data(S) Collection: Data(S) were collected using data collection form and morisky medication adherence scale (mmas-8) for the assessment of medication adherence and later it was correlated to find relation of polypharmacy and comorbid condition with the hypertensive patients from selected areas of Mangalore Dakshina Kannada district. The obtained data(s) were kept confidential.

Data Analysis: Statistical analysis involves collecting and scrutinizing every data sample in a set of items from which samples can be drawn and were analyzed using Microsoft Excel.

RESULT

During the study period, 150 patients were interviewed and their prescription studied. Out of 150 patients, 68 (45.3%) were males and 82 (54.6%) were females. Age of the patients in the study population ranged from 31 years to 90 years. The

highest percentage of age group was 51-70 years (76.6%) followed by 71-90 years (16%) and age group of 31-50 years (7.3%) as shown in Figure 1. The social habits of

the population revealed that 13.3% of the populations were alcoholics and 12% were smokers.

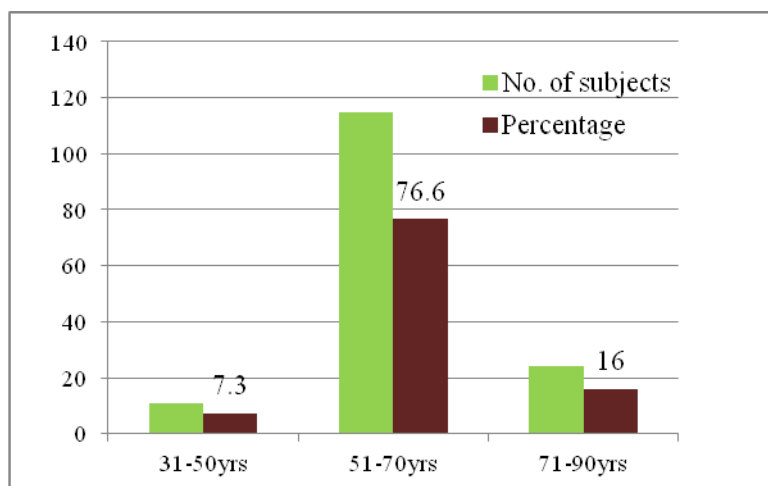


Figure. 1 Distribution of study population according to age (N=150)

AREA-WISE DISTRIBUTION:

Area-wise distribution of subjects from different parts of Dakshina Kannada (D.K.) district participated in the study is as follows (Table 1):

Table 1: Area-wise distribution of subjects (N=150)

Area (D.K. district)	No. of patient
Kankanady	39
Valachil	26
Valencia	31
Jeppu	23
Padil	31

ASSESSMENT OF COMORBID CONDITIONS

Hypertensive patients suffer from various comorbid conditions. Out of the total 150 subjects, patients with only hypertension were 100 and those having hypertension along with co morbidities numbered 50 (Table. 2).

Among the 100 subjects with only hypertension, adherence was analyzed using Morisky scale and found that 15 of them showed high adherence, 39 were medium adherent and 46 were low adherent to antihypertensive medications.

The present study also revealed that out of the 50 patients who were suffering from comorbidities other than hypertension, 56% (28) of the patients suffered from

diabetes, 8% (4) of the patients suffered from hyperlipidemia, 6% (3) patients had CKD and IHD, and 4% (2) of the patients had asthma, COPD and gastritis as evident from Figure 3. Patients with comorbidities other than those mentioned above were comparatively less.

Table. 2: Assessment of adherence in only Hypertensive patients

No. Of patients with only hypertension	High Adherent	Medium Adherent	Low Adherent
100	15	39	46

Table: 3- Patient with other co morbidities (N=50)

Co-morbidities	No. of patients
Acute MI	1
Diabetes	28
Asthma	2
BPH	1
OAB	1
IHD	3
CKD/AKI	3
CVA	1
COPD	2
Fatty liver	1
Gastritis	2
Thyroid disease	1
Cholesterol/Hyperlipidemia	4
Heart block	1
Angina	1
Breathlessness	1
Rheumatoid Arthritis	1
Varicose veins	1
STEMI	1
Tumour of abdomen	1
URTI	1
Orthostatic hypotension	1

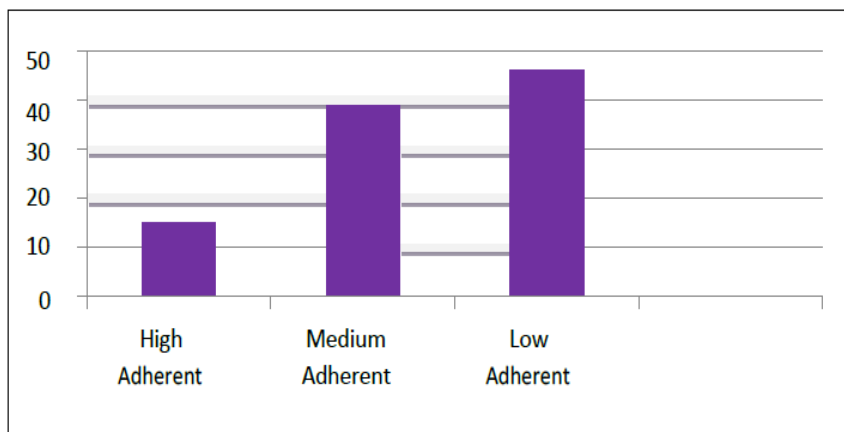
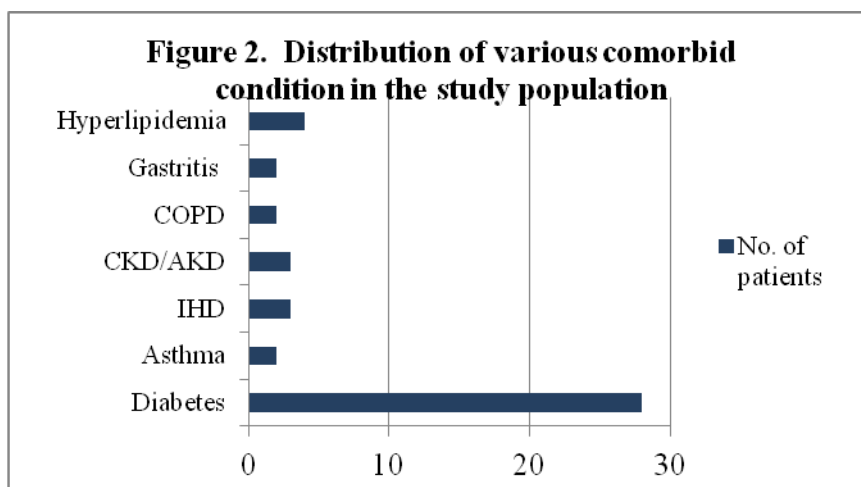


Figure 2: Medication adherence among people with only hypertension



Among 50 subjects with co morbidities, it was found that 3 of them showed high adherence, 11 were medium adherent and the remaining 36 were low adherent to their antihypertensive medications.

Table. 4 -Assessment of medication adherence in co morbid condition

No. of patients with comorbidities	High adherent	Medium adherent	Low adherent
50	3(6%)	11(22%)	36(72%)

Comparing medication adherence in both the groups i.e. group of subjects with only hypertension and the group of subjects with other co morbid conditions, suggests that people with only hypertension were found to be much more adherent than people with co morbidities. The reason for this could be increased number of tablets to be taken daily or the frequency of administration.

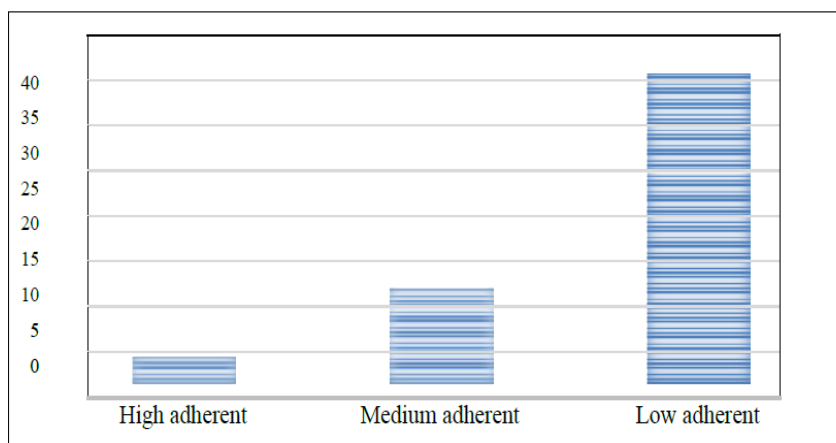


Figure. 3 Medication adherences in subjects with other co morbid conditions

PREVALENCE OF POLYPHARMACY

The result shows that 10.6% of the study population had poly pharmacy i.e. they took more than 5 medications at a time due to presence of comorbid conditions (table 3). This could be one of the reasons for non-adherence to medication. However, the percentage of people with poly pharmacy is less which is affirmative.

Table. 5- Patients with poly pharmacy

No. of patients	Patient code	Percentage (%)
16	4,9,15,26,34,35,42,46,66,70,72,74,78, 101,121,146	10.6

The study also finds that none of the patients with poly pharmacy is high adherent to the therapy. The reason for which is quite understandable that the burden of taking many medications must have led to non adherence.

Table. 6- Assessment of adherence in poly pharmacy

No. of patients	Low adherent	medium adherent
16	10	6

DISCUSSION

Adherence to appropriate medical therapy for hypertension can result in controlled blood pressure and reduction in adverse outcomes. Early discontinuation of treatment is a major problem with long term antihypertensive treatment. There is still much uncertainty about the pathophysiology of hypertension. [4] Thus, very often, hypertensive patients are compelled to prescribe a number of medications. Polypharmacy or the use of multiple medicines for a single patient not only increases the pill burden for the patient but also aggravates the chance of drug-drug and drug-food interactions. The present study was designed to evaluate the influence of comorbid conditions and polypharmacy among hypertensive patients on adherence to antihypertensive drugs. 150 patients involved in the study who were under anti-hypertensive therapy. Inclusion of each patient's demographic characteristics was mandatory: 45.3% males and 54.6% females participated in the study. Thus, the present study revealed the prevalence of

hypertension among females as comparable to the previous studies. A clinical based study by Sahoo et.al., was conducted in two health centres in Singur block, West Bengal included a total of 186 study subjects. As per MMAS score, 55.4% were highly adherent and 32.3% and 12.3% belong to the category of medium and low adherence respectively. Poor adherence to drugs was significantly ($p < 0.05$) associated with contextual variables like age, literacy, socio-economic status, duration of treatment and presence of comorbidities. [5]

This study also evaluated that 33.3% (50) of the study population suffered from at least one comorbid condition – the most common being diabetes (56%). When combined with diabetes, HTN has been shown to predict and promote increased risk for cardiovascular disease events over and above each risk factor alone. [6]

The number of patients who adhered to medication is less in comorbid condition that those with only hypertension. Thus, it can be predicted that the reason for non-adherence could be increased number of medications in those with underlying comorbid conditions.

The result shows that 10.6% of the study population had poly pharmacy. This could be one of the reasons for non-adherence to medication. It is true that literature studies in various parts of the world suggested that hypertension is associated with various comorbid diseases and requires concomitant medications. Moreover, drug safety and efficacy are dependent on a number of factors including genetic variability of an individual. Thus, therapeutic success of fixed-dose combinations depends on a number of factors including the quality of formulation, maintenance of storage, drug distribution, set up, rational prescribing, and proper use of drug by patients. The present study thus tried to evaluate the level of comorbidity and polypharmacy among hypertensive patients in the community.

CONCLUSION

The present study established that the number of patients who adhered to medication is less in comorbid condition than those with only hypertension due to multiple drugs in prescription, important information obtained from the present study highlighted that prevalence of polypharmacy was associated with non-adherence. Therefore, reducing pill burden and yet providing maximum benefit to the patients is of utmost importance.

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