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Assessment of Medication Adherence among Patients with Chronic Hypertension in Pakistan

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ABSTRACT

Background: Chronic uncontrolled hypertension carries long-term implications for morbidity and mortality, with sustained elevated blood pressure levels precipitating irreversible organ damage to critical systems. Poor medication adherence is one of the leading factors related to uncontrolled hypertension.
Objective: This study was carried out for determining medication adherence and factors related to adherence among patients with chronic hypertension.
Methods: It was a community based cross-sectional study involving 266 hypertensive patients selected using non probability convenience sampling technique. Following informed consent information was obtained via google forms using a pre-tested questionnaire (Cronbach alpha=0.83) having two sections. The first section was related to sociodemographic details of the patients and the second section was based on Morisky medication adherence scale (MMAS-8). The software used for analysis was SPSS version 24. Qualitative variables were summarized as frequency/ percentage. Chi-square test was used as test of significance. p value $\leq$ 0.05 was considered statistically significant.
Results: It was found that majority of the patients 189(71%) were females. Most 242(91.9%) study participants belonged to middle socio economic class. Only 14% of the study population was found to be adequately adherent to their medication. The adherence was found to be significantly related to age (p = 0.00) and education (p = 0.00) of respondents.
Conclusion: The medication adherence was found to be low with only 14% patients having adequate adherence to medication and 86% of patients having poor adherence to prescribed treatment .This is a grave situation as consequences of non-adherence are profound, extending beyond individual health outcomes to encompass broader societal and economic impacts. All efforts should be made towards maximizing adherence and empowering patients to manage their hypertension effectively, thereby mitigating the surging consequences of non-adherence on their individual wellbeing and overall public health.

Keywords: *Medication adherence, hypertension, antihypertensive medications, Morisky medication adherence scale.*

INTRODUCTION

Hypertension is a grave medical condition that significantly increases the risk of mortality and morbidity. According to WHO, an estimated 1.13 billion people all over the world have hypertension. The majority of these are the residents of low and middle income countries.[1,2] In Pakistan nearly 5.5 million men and 5.3 million women are affected by hypertension.[3] A meta-analysis reported that in Pakistan the overall pooled prevalence of hypertension was 26.3.[4] Furthermore studies have reported that most patients in Pakistan are having uncontrolled hypertension. Only less than 3% patients have controlled hypertension.[3] One of the main factors linked to uncontrolled blood pressure in Pakistan is medication non-adherence.[5] According to WHO Adherence is defined as "the extent to which a person's behavior-taking medication, following a diet, and/or executing lifestyle changes-corresponds with agreed recommendations from a health care provider".[6] Poor adherence to long-term therapies significantly undermines the effectiveness of treatment and represents an important obstacle in disease control in terms of both the patients' quality of life and health economics. Poor adherence has been described as the most significant cause of uncontrolled blood pressure and around 50-70% of people do not follow prescribed medication schedule.[7] It has been estimated that the global prevalence of non-compliance to anti-hypertensive medication is 30 %.[8] However studies have shown that compliance to anti-hypertensive medication varies markedly between 20 and 80%.[9] According to a study held in Isla-

mabad, adherence to recommended antihypertensive medication was unsatisfactory in hypertensive patients visiting different healthcare settings.[10]

Patients may discontinue their medications due to experiencing disagreeable side effects or encountering monetary barriers that prevent them from managing to pay for their prescribed treatments.[11] Moreover, the complex nature of medication schedules or forgetfulness can add to gaps in adherence, compounded by patients' insufficient understanding of the seriousness of their condition. Additionally, fears of myths regarding medication may further hinder adherence behaviors .The resultant penalties are multifaceted and profound. Uncontrolled hypertension significantly elevates the risk of complications, placing a substantial burden on already frail healthcare system in context of a developing country like Pakistan and also diminishes patients' overall quality of life.[11] Moreover, poorly managed hypertension can exacerbate comorbid conditions such as kidney disease, diabetes, and ocular complications, necessitating more intensive and costly interventions.[12]

Tackling medication non-adherence is a challenging task. The foremost step in this regard is an estimation of the burden of non-adherence among hypertensive patients. Information is limited on adherence to anti hypertension medications in Pakistan. The aim to conduct this study was to determine medication adherence among hypertensive patients and to assess the relationship of various sociodemographic factors with medication adherence among them. Despite clinically effective medicines being available for control of hypertension, it remains uncontrolled in majority of patients and leads to profound adverse effects both for the individual patients as well as the society at large. It is very important to study the current pattern of medication adherence in a community based setting to gain better understanding of the current situation and related factors. The study will help in generating local evidence for devising relevant and contextually appropriate guidelines for improving medication adherence among hypertensive patients. This will contribute towards reducing morbidity and mortality due to hypertension and its complications in the community in the longer run.

METHODS

It was a community based, cross-sectional study of six months duration conducted among patients having chronic hypertension. The sample size of 273 was determined using WHO formula keeping the expected proportion of adherence as 77% [9], 95% confidence level and 5% margin of error. Following approval of the study, the participants fulfilling the inclusion criteria of age above 20 years, diagnosed with essential hypertension ,belonging from any city within Pakistan and taking antihypertensive medication for at least past six months were invited to participate in the survey. Patients having secondary hypertension, those suffering from psychiatric illnesses, those unable to give informed consent and pregnant females were excluded from the study. The nature and objectives of the study were explained to the eligible participants and informed consent was obtained. Data were obtained using google forms. The initial section was regarding the sociodemographic details of the participants and second section had questions for adherence assessment based on MMAS-8 (Moriskey Medication Adherence Scale).The MMAS-8 has been proven reliable (alpha=0.83) for adherence assessment among hypertensive patients and it has been used in numerous studies for assessment of medication adherence related to chronic diseases.[13,14] All dimensions of intentional and unintentional adherence based on forgetfulness, carelessness, stopping medication when feeling better and stopping medication when feeling worse are included. The scale is scored 1 point for each "no" and 0 points for each "yes". The total score ranges from 0 (non-adherent) to 8 (adherent). Based on recommended threshold the patients who scored 6 or more ($\geq$75%) were considered as having good/adequate adherence while those who scored less than 6(< 75%) were termed as having poor adherence. This cut off was suggested by Morisky, originator of MMAS-8, as a benchmark of good adherence to medication.[14] Incomplete forms were discarded and remaining data for 266 patients was entered and analysed using SPSS version 24. Qualitative variables were summarized as frequency percentage and displayed as pie charts. The Chi square test was used to determine relationship between various independent variables and medication adherence. A p value $\leq$ 0.05 was considered as statistically significant. Phi or Cramer's V were calculated for effect size as appropriate.

RESULTS

It was found that majority 71.1% were females and 28.9% were males. Most of the participants 123(46.2%) were in younger age range of 20-35 years. Around 74 (27.8%) participants belonged from middle age group 36 – 50 years and 69(26%) participants belonged from above 50 years age group.

Regarding the educational status it was found that 11(4.1%) participants were illiterate, 45 (17%) participants were having F.S.C and 157(59%) participants had completed graduation. While only 53(19.9%) participants had done post-graduation. The analysis further showed that 21 (7.9%) participants belonged from upper socio econo-

mic status, 242 (91.0%) participants belonged from middle socioeconomic status and only 3(1.1%) reported belonging from low socio-economic status. Around 235(88.30%) patients self-reported that their BP was controlled and 31(11.7%) said that their BP was uncontrolled. The background features of research participants are illustrated in Table 1.

Table 1: *Socio-Demographic and Related Characteristics of Chronic Hypertensive Patients (n = 266)*

Variables	f	%
GENDER		
Males	77	28.9%
Females	189	71.1%
AGE		
20-35 years	123	46.2 %
36-50 years	74	27.8%
Above 50	69	26.0%
EDUCATION		
Illiterate	11	4.1 %
Undergraduates	45	17.0 %
Graduates	157	59.0%
Post Graduates	53	19.9%
SOCIOECONOMIC STATUS		
Upper Class	21	7.9%
Middle Class	242	91.0%
Lower Class	3	1.1%
SELF REPORTED STATE OF BP CONTROL		
Yes	235	88.30%
No	31	11.7%

Based on the results of Morisky Medication Adherence Scale only 37(14%) of respondents obtained a total score 6 and above showing that they had good adherence to antihypertensive medication. However a vast majority of 229 (86%) participants obtained low scores showing poor adherence to prescribed medication. (Figure 1).

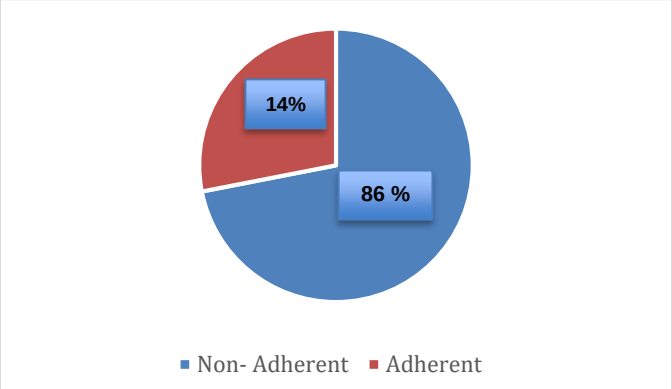

Figure 1: *Aherence to Anti Hypertensive Medication Among Chronic hypertensives (n = 266)*

The results of cross tabulation of various independent socio demographic variables with medication adherence and application of Chi square showed that 11.1% females and 20.8% males were having good adherence to prescribed medication. The difference was statistically non-significant. Moreover 30.2 % patients having post-graduation were found to have good adherence Compared to 27.3% illiterates, 11.1% undergraduates and 8.3% graduates who also had adequate adherence. The difference was statistically significant (p = 0.00, $\varphi = 0.016$, small effect size). It was determined that number of patients having good adherence was highest in above 50 years age group (27.5%) followed by 36-50 years age group in which 14.9% patients had good adherence and lastly 20-35 years age category where only 5.7% patients reported adequate adherence. This difference was also statistically significant (p = 0.00, $\varphi = 0.015$, small effect size). (Table 2).

Table 2: *Cross Tabulation of Various Socio Demographic Factors With Adherence to Anti-Hypertensive Medication (n = 266)*

Variables		Adherence		Total	p value	Effect Size (Phi or Cramer's V)
		Good n (%)	Poor n (%)			
GENDER	Males	16(20.8)	61 (79.2)	77		
	Females	21(11.1)	168(88.9)	189	0.06	0.007
EDUCATION	Illiterate	3 (27.3)	8(72.7)	11		
	Undergraduates	5 (11.1)	40 (88.9)	45	0.00*	0.016
	Graduates	13 (8.3)	144 (91.7)	157		
	Post Graduates	16 (30.2)	37 (69.8)	53		
AGE	20-35 years	7 (5.7)	116 (94.3)	123		
	36-50 years	11 (14.9)	63(85.1)	74		0.015
	Above 50	19(27.5)	50(72.5)	69	0.00*	
Total		**37**	**229**	**266**		

DISCUSSION:

Hypertension is one of the most widespread chronic diseases. Uncontrolled hypertension is a major risk factor for damage to critical organs and non-compliance to antihypertensive medication is the most common cause of uncontrolled hypertension.

The medication adherence to antihypertensive medication therapy was 14%, in the current study. This estimate is lower than results of a study held at Aga Khan University Hospital which reported adherence to be 68%.[15] Likewise our recorded adherence was lower than another study where adequate medication adherence was reported by 115 (25.6%) out of 450 patients.[16] The difference in the studies could be due to study setting different then community based and varied selection criteria for the sample population. The studies conducted in hospital setting may report higher adherence rates as patients usually present after complications and may take medicines to avoid further deterioration in condition.

According to our study, males (23%) were found to be more complaint than females (11.1%). Our finding was consistent with the finding of a similar study where non adherence was related with female gender (odds ratio [OR], 1.44; *P* = .003) .[16] Our finding was contrary with the finding of a study held in Malaysia at primary healthcare center .[17] The study reported that adherence among female patients was more as compared to male patients. This is also in agreement to another study on patient's adherence to antihypertensive medication which found that generally females tend to be more adherent to medications than males.[18]

Age was found to be strongly related with adherence in this study. Older people were more compliant than the ones in younger age group. This finding is in agreement with the results of other studies. [17,19] Patients in older age groups may be having more co morbid conditions and an increased perception of vulnerability to complications which shapes their behavior in favor of adherence. Similarly adherence had a significant relation with education. The results are comparable to another study conducted in Pakistan where the determinants of good adherence included education (OR, 0.61; *P* = .02).[16] However the finding is in contrast to another study.[20] It is suggested to initiate the educational drives to increase the responsiveness about not only the risk factors, complications and management of hypertension but also the importance of adhering to prescribed medication. Global events like World Hypertension Day can be used for awareness. Secondly, we can work on enhancement of counselling skills of health care providers. Thirdly prescribing the medications according to the financial status of the patients would be really fruitful in this cause.

The strengths of the study includes recruiting the sample from general population to ensure maximum representtative sample and using a standardized questionnaire for measuring adherence which has been demonstrated to have a high validity and reliability. However the limitations included having a cross sectional design where results of sensitive questions may be subject to social desirability bias. Moreover relying on self-reported measures by the patients themselves. To guarantee the precision of data regarding compliance, impartial measurement such as prescription replenishment records and pill counts ought to be used in future studies.

CONCLUSION

The study found a low percentage of adequate medication adherence among hypertensive patients with only 14% having adequate adherence to prescribed medication. This is a grave situation as consequences of non-adherence are profound, extending beyond individual health outcomes to encompass broader societal and economic impacts. Alleviating non-adherence requires an all-inclusive approach that assimilates patient education, tailored care plans, and tailored support mechanisms to address the underlying barriers to adherence effectively. Some recommendations include counselling to patients to maintain adherence and awareness provision regarding its importance. Moreover fixed time of taking medication should be advised and medications should be prescribed to the patients according to their financial status and the selection should be best possible for the person having least side effects to maximize the chances of adherence.

CONFLICT OF INTEREST / DISCLOSURE

Nil.

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