

ASSESSMENT OF DRUG COMPLIANCE AMONG HYPERTENSIVE PATIENTS

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ABSTRACT

Objective: To assess the compliance in hypertensive patients to anti-hypertensive medications.

Methodology: A descriptive case series study was conducted in the Department of Medicine, Lady Reading Hospital and Khan Memorial Clinic at Abaseen Hospital Dabgari Garden, Peshawar from November 2018 to January 2019. The study included 196 hypertensive patients of both genders above 18 years of age. All hypertensive patients taking antihypertensive medications were included. Demographic and clinical details were recorded regarding duration of hypertension, name, dose and number of drugs being taken and presence of any comorbidity noted. SPSS version 21.0 was utilized for data entry and statistical analysis. Chi-square test at p value ≤ 0.05 at 95% confidence level was considered statistically significant.

Results: Among 196 patients, 49 (25%) were male and 147 (75%) were female; with a male to female ratio of 1:3. Age of the patients ranged from 18 to 93 (55.99 \pm 10.31) years; 120 (61.2%) belonged to 40-60 age group whereas 60 (30.6%) were above 60 years. Overall, 111 (56.6%) patients had poor compliance and 85 (43.4%) had good compliance to medication; 68 (34.7%) were taking beta blockers while 70 (35.7%) were on combination of drugs; those on angiotensin II receptor blockers and combinations had better compliance ($p=0.001$).

Conclusion: Majority of the patients in this study were non-compliant to anti-hypertensive medications. There was no statistical difference between different age groups and gender in relation to compliance. Use of ARBs and drug combinations significantly correlated with good compliance.

Key Words: Drug Compliance, Hypertension, Antihypertensive medications, Comorbidities

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INTRODUCTION

Hypertension is a common universal problem with increased morbidity and mortality, particularly in non-compliant individuals¹. Globally, a billion of people are hypertensive with a mortality of four million a year². About one third of American adults have hypertension, almost half of these are uncontrolled. Its prevalence is 10-17% in Mediterranean countries and the Middle East³. Its prevalence across the South Asian Association for Regional Cooperation (SAARC) countries is variable; ranging from 17.9% in Bangladesh to 33.8% in Nepal, 31.4% in India and 23-25% in Pakistan; being higher among women in the SAARC Countries⁴. In Pakistan, hypertension affects 18% of the young above 15 years and increasing to 33% above 45 years old⁵. Compliance to antihypertensive medication refers to the level of

obedience to the treatment measures, with the objective to maintain the BP at normal levels. Prevalence of non-compliance to medication in hypertensive patients is between 15 to 54%⁶. Poor compliance to medication is a major contributory factor not only to worse cardiovascular prognosis but also a well-recognized cause of uncontrolled and "resistant" hypertension⁷. Prevalence of hypertension increases with increasing age. In elderly population, around 80% are hypertensive and about half (55%) of them are non-compliant to medication⁸. The WHO prevalence of drug compliance is reported between 50-70%⁹.

Patient's compliance to medications is affected by a variety of socioeconomic, cultural, personal, behavioral, environmental and drug related factors^{1,5,10}. There are wide variations in the drug compliance in hypertensive patients in our community due to a variety of reasons.

The aim of this study was to show the general trend of our hypertensive patients regarding compliance to their medications. It will be helpful in the overall awareness and management planning of such patients to adhere to their treatment and thus reduce the cardiovascular complications of uncontrolled BP. Therefore, the objective of this study was to assess the compliance of hypertensive patients to anti-hypertensive medications.

METHODOLOGY

This was a case series descriptive study conducted in the Out Patient Department of Lady Reading Hospital and Khan Memorial Clinic at Abaseen Hospital, Dabgari Garden Peshawar; from 1st November 2018 to 31st January 2019. A total of 196 hypertensive patients were included in the study. Size of the sample was calculated using the WHO Sample Size Calculator, with 95% confidence level, 5% margin of error and 15% prevalence population proportion. Consecutive sampling technique was used.

All adult hypertensive patients, of either gender; 18 years of age or above, visiting OPD/Private Clinic; taking antihypertensive drugs for at least 6 months and voluntarily consenting, were included in the study. Patients less than 18 years of age; unconscious/comatose and confuse patients; those having psychiatric problems; and those not willing to participate in the study or give written consent; were excluded from the study. Hypertension was defined as BP above 140/90 mmHg, or a patient taking antihypertensive medication(s). Drug Compliance was defined as the extent to which a patient acts according to the prescribed dose and interval of anti-hypertensive drug(s)⁶. Compliance was calculated according to the proportion of days covered (PDC) by the patient as explained by David Nau¹¹. The patient taking medication(s) in the last 30 days was determined, divided by the total number of days (30) and expressed as percentage. The cutoff point was 80%; score of 80% or above was considered as 'Good' Compliance and less than 80% was labelled as 'Poor' Compliance. Comorbidity means any other disease present with hypertension in the same patient like diabetes mellitus (DM), coronary artery disease (CAD), dyslipidemia, obesity, chronic kidney disease (CKD).

The study was conducted after approval from the Institutional Research Ethical Review Board. Informed written consent was taken from all the participants. Bio-data of all patients were obtained. A detailed history was taken from the patient regarding diagnosis and duration of hypertension, drugs history, name, dose and frequency of drug(s) being taken, its cost and side effects; and compliance to medication. Patient's education and socioeconomic status was assessed; any comorbidity, if present, was recorded. After a rest of 10 minutes, patient's BP was recorded using a stan-

dard Sphygmomanometer (Mercury) of adult size and Littmann Stethoscope in sitting position, in calm and comfortable environment, in both arms. At least three readings were taken and the mean was recorded on the patient's proforma. A meticulous clinical examination was performed by a consultant physician and findings noted. Relevant laboratory investigations were done like, blood sugar, glycated hemoglobin, serum urea/creatinine, electrolytes, cholesterol, triglycerides and urine analysis.

All the information was recorded in the predesigned proforma. Patients data were entered and analysed using SPSS (IBM Corporation) version 21 software. Mean \pm standard deviations were calculated for the continuous (numerical) variables. Frequencies and percentages were calculated for all the categorical variables. The statistical significance was set at p value equal to or less than 0.05. Results were presented in the form of tables and graphs which were compared with regional and international studies.

RESULTS

Out of 196 patients included in the study, 49 (25%) were male and 147 (75%) were female; with a male to female ratio of 1:3. Overall compliance to medication in the study participants was 'good' in 85 (43.4%) patients and 'poor' in 111 (56.6%). Gender wise there was no statistically significant difference between men and women in the two groups, ($p = 0.8$); 45% male and 43% female had good compliance. Similarly, 55% men and 57% women had 'poor' compliance, as shown in Table 1.

Age of the patients ranged from 18 to 93 years; mean age was 55.99 ± 10.31 years. Among 196 patients, 120 (61.2%) were of 40-60 age group. Age of the participants revealed a normal distribution pattern, as shown in the histogram/graphs (Figure 1). Compliance in different age groups revealed that in the under 40 years group, 6% had good compliance; in the 40-60 age group 60% had good compliance; similarly in the above 60 years, good compliance was 34%. However, regarding compliance in different age groups, there was no statistical difference between the groups ($p = 0.45$) as shown in the Table 2.

Duration of hypertension ranged from 1 to 20 years with mean of 6.63 ± 3.992 years. Duration significantly correlated with compliance to medication ($p < 0.001$). The number of antihypertensive drugs used ranged from 1 to 5 with mean 3.98 ± 1.705 . Among 196 patients, 68 (34.7%) were on beta blockers while 70 (35.7%) were on combination of drugs. Compliance in relation to drug groups is shown in Table 3. Patients taking ARBs and combinations had good compliance while those on Beta blockers had poor compliance. The correlation of compliance with drugs was significant ($p < 0.001$).

Table 1: Gender and compliance to medication

Compliance to Medication		Gender		Total
		Female	Male	
Poor Compliance	within Compliance	84/111 (75.7%)	27/111 (24.3%)	111 (100%)
	within Gender	84/147 (57.1%)	27/49 (55.1%)	111/196 (56.6%)
Good Compliance	within Compliance	63/85 (74.1%)	22/85 (25.9%)	85 (100%)
	within Gender	63/147 (42.9%)	22/49 (44.9%)	85/196 (43.4%)
Total	within Compliance	147/196 (75.0%)	49/196 (25%)	196 (100%)
	within Gender	100%	100%	100%

Chi square (p) value=0.8

Table 2: Age groups and compliance to medication

Age groups	Compliance to Medication		Total
	Poor Compliance	Good Compliance	
Less than 40 years	11 (9.9%)	5 (5.9%)	16 (8.2%)
40 to 60 years	69 (62.2%)	51 (60%)	120 (61.2%)
Above 60 years	31 (27.9%)	29 (34.1%)	60 (30.6%)
Total	111 (56.6%)	85 (43.4%)	196 (100%)

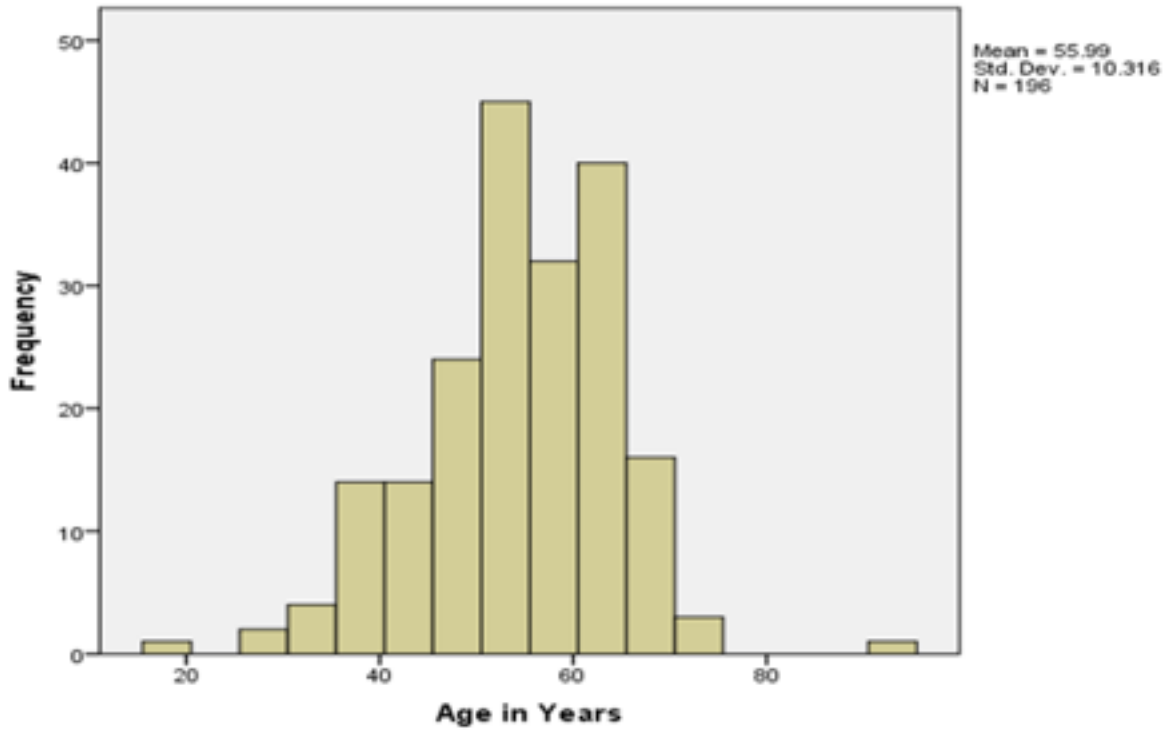
Chi square p =0.450

Table 3: Drugs groups and compliance to medication

Drugs Groups	Compliance to Medication		Total
	Poor Compliance	Good Compliance	
ARBs	10 (9%)	13 (15.3%)	23 (11.7%)
ACEIs	1 (0.9%)	2 (2.4%)	3 (1.5%)
Beta Blockers	56 (50.5%)	12 (14.1%)	68 (34.7%)
Calcium Channel Blockers	19 (17.1%)	13 (15.3%)	32 (16.3%)
Combinations of Drugs	25 (22.5%)	45 (52.9%)	70 (35.7%)
Total	111 (100%)	85 (100%)	196 (100%)

Chi Square p < 0.001

Figure 1: Age distribution of the study participants



Among 196 hypertensives, 73 (37.2%) patients had no comorbidity with hypertension; 123 (62.8%) patients had different comorbid conditions, in various combinations. Among these 123 patients, the most common comorbidity was dyslipidemia in 47 (24%), followed by DM in 27 (13.8%) patients. CKD was the least common comorbidity in 1 patient. The correlation of comorbidity with compliance was not significant ($p = 0.877$).

DISCUSSION

Compliance to medication is a global issue, prevalent everywhere, as reported from different regions; some of the study reports are in accordance with our study findings whereas others are contrary to ours, as discussed below. Compliance to medication in our study was 'good' in 43.4% patients and 'poor' in 56.6%. Gender wise there was no statistically significant difference between the two groups ($p = 0.8$); 45% male and 43% female had good compliance. Mean age of our patients was 55.99 ± 10.31 ; 61% were between 40-60 years and 30% were above 60; however, there was no significant difference between different age groups ($p = 0.45$).

Findings of our study are in conformity with other studies. A study done by Daniel et al⁶ revealed that 45.1% patients had good compliance; Similarly, 45% compliance rate was reported from Palestine by Al-Ramahi¹². A Study from Iran has shown comparatively low compliance of 24% by Kamran et al³. In a French survey of elderly population by Allibe et al¹³, 39.5% patients were compliant. Sandoval et al¹⁴ reported overall compliance of 36.6% in Chile. In a study of elderly Chinese patients by Lo et al⁸ in Hong Kong, 44.1% were compliant. Overall compliance in patients from Madinah-al-Munawwara was also poor (35.1%) as reported by Mahmoud¹⁵.

Many studies conducted in various cities of Pakistan had varying results; low compliance similar to our study findings was reported in a study from Karachi by Bilal et al¹⁶ where 64% of women, majority (68.14%) had poor compliance to medications. In another study from Karachi by Siddiui et al¹⁷, involving 283 hypertensives with 62.2% females; majority (85%) had poor compliance. Similarly, 64.7% patients from Quetta Pakistan, had poor compliance as reported by Saleem et al⁵. In Khyber Pakhtunkhwa, a small study of 89 patients in Abbottabad by Ahmed et al¹⁸; mean age 55.8 ± 13.4 years, 75% women; 51.7% patients were non adherent to their drugs. On the other hand, in contrast to the findings of our study, better compliance to medications has been reported in other studies. A meta-analysis of 25 studies from 15 countries involving 12603 subjects revealed that 57% Asians were compliant and 43% non-compliant¹⁹. In the American Jackson Heart Study (JHS) of 3558 participants, the non-compliance ranged between 24-28% in African Americans²⁰. In FORSAGE study from

Moscow²¹, 67.5% patients were compliant to medication. In a Canadian study by Riox and Hunt²², better compliance (72%) was seen in elderly patients above 80 years and less in younger patients. Similarly, 63% patients were compliant in a small study by Alanzi et al²³ in Saudi Arabia. In a Lebanese study, good compliance of 69.9% was reported by Saarti et al¹⁰. In a Chinese cohort study of 83,884 patients, Wong et al²⁴ reported that 85.5% had good compliance to medication. Similarly, a study of 2445 hypertensives by Kang et al⁹ in Hong Kong China, with mean age of 65.5 ± 10.95 years; 56.1% women, 55.1% patients were compliant to medications. In another similar study of 653 Malaysian patients with mean age of 57.84 years, 62.8% females; 53.4% had good compliance²⁵. In an Indian study by Meena et al²⁶ of 1036 patients with mean age of 65 ± 5.6 years, 67.9% men, two thirds (67.8%) were compliant to medications. Two studies done in Karachi have shown compliance better than the patients in our study; a study by Hashmi et al²⁷ showed 77% compliance whereas Ali et al²⁸ reported drug compliance of 55.7% in male hypertensives.

Poor compliance to medication seen in the majority of the patients in our study may be due to a variety of reasons including personal, socioeconomic, cultural, environmental and education of the patients on the one hand and availability of resources and health care facility on the other. Further studies are needed to explore the factors leading to poor compliance in these patients.

LIMITATIONS

The study was conducted in the OPD and Private Consultation Clinic where the patient's reported compliance may not be true representative of that in the community; a community based study will be more appropriate to assess the true compliance to medications. Moreover, a large sample size will be more appropriate and desirable to draw a better conclusion regarding compliance to antihypertensive medications.

CONCLUSION

Majority of patients in this study were non-compliant to antihypertensive medications. There was no statistical difference between different age groups and gender in relation to compliance. Use of ARBs and drug combinations significantly correlated with good compliance. Further studies are needed to evaluate various factors responsible for poor compliance to medications in hypertensive patients.

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CONTRIBUTORS

YA conceived the idea, planned the study and drafted the manuscript. MARA, ZR and ZA helped acquisition of data, did statistical analysis and critically revised the manuscript. All authors contributed significantly to the submitted manuscript.