Original Article

Compliance to Antihypertensive Medication and Associated Factors among Hypertensive Chronic Kidney Disease Patient Attending at a Tertiary Care Level Hospital

Shahina Parvin[1], Shahnaz Parvin[2], Shamima Nasrin[3], Nargis Akter[4], Rozina Afroz[5], Rizwana Sharmin[6], Papiya Sultana[7], Syeda Kaniz Fatema[8]

Abstract:

Background: Achieving optimal blood pressure control remains a challenge in hypertensive chronic kidney disease patients, however monitoring and improving medication compliance would be a very useful tool to improve outcomes and to reduce the risk of complications like end-stage renal disease, cardiovascular disease and cerebrovascular accidents. Factors associated to compliance have importance for successful treatment of patients to prevent jeopardize of the goal of treatment. **Objectives:** To determine the proportion of treatment compliance among hypertensive chronic kidney disease patients. **Method:** An observational cross-sectional study was conducted in the department of Nephrology of Dhaka Medical College Hospital from January 2022 to December 2022. 264 hypertensive CKD patients were included in this study. Structured questionnaire was used to collect patients information like socio-demographic and behavioral characteristics, clinical history and prescribed antihypertensive medication. Collected data analyzed by using SPSS 26.0. P value of < 0.05 was significant. **Result:** Among 264 CKD patients 58% male, 42% female and 27.3% patients were in 51-60 years age group. Only 32.1% patient achieved BP (<140/90 mm of Hg) control with antihypertensive therapy and 36.7% patient received three drug combination therapy. Compliance to therapy was significant in patients with controlled BP and in patients who were taking three drug combination therapy (p = 0.001). 67.8% patient were compliant to antihypertensive therapy and significant association was found between regular intake of medicine to compliance (p=0.001). Patients who were taking table salt regularly (38.2%), smoker(18.9%), skipped medication because of feeling better(18.2%), side effects(19.3%) and medication cost(4.1%) and physically inactive(28.1%) patients were noncompliant to therapy. This factors have significant association with medication compliance (p = 0.0001). Conclusion: Physical inactivity, smoking, regular table salt consumption, and medication side effects were common causes of patients' non-compliance.

Keyword: Compliance, Antihypertensive therapy.

J Com Med Col Teachers' Asso Jan 2025; 29(1): 32-36

1. Dr Shahina Parvin
   Lecturer, Department of General & Dental Pharmacology, Dhaka Dental College, Dhaka
2. Dr Shahnaz Parvin
   Lecturer, Department of General & Dental Pharmacology, Dhaka Dental College, Dhaka
3. Dr Shamima Nasrin
   Assistant Professor, Department of Pharmacology & Therapeutics, Ashiyan Medical College and Hospital, Dhaka
4. Dr Nargis Akter
   Lecturer, Department of Pharmacology & Therapeutics, Comilla Medical College, Comilla
5. Dr Rozina Afroz
   Senior Scientific Officer, Department of Medical Entomology Institute of Epidemiology Disease Control and Research (IEDCR), Mohakhali, Dhaka
6. Dr Rizwana Sharmin
   Virilogist, Institute of Public Health, Mohakhali, Dhaka
7. Dr Papiya Sultana
   Lecturer, Department of Pharmacology
   Shaheed Tajuddin Ahmad Medical College, Gazipur
8. Dr Syeda Kaniz Fatema
   Lecture, Department of Pharmacology
   Mugda Medical College, Dhaka

Address of correspondence:
Dr Shahina Parvin
Lecturer, Department of General & Dental Pharmacology, Dhaka Dental College, Dhaka
Email: ifti8151@gmail.com, Mobile: 01884644266

Introduction:

Hypertension is a global public health problem and accounted for 10.4 million deaths and 218 million disability adjusted life in 2017[1]. The prevalence of HTN is 26.2% and CKD is 22% in Bangladesh which is alarmingly high[1,2]. CKD are responsible for an estimated 1.2 million deaths worldwide in 2017[3].

DOI:https://doi.org/10.3329/jcomcta.v29i1.81465

Hypertension prevalence gradually increased with advancing chronic kidney disease stages, increasing approximately 79% to 95.5% in patients with stage-1 CKD to stage- 4 & stage-5 CKD. About 15.8% hypertensive patients found to have CKD[4]. People with hypertension developed cardiovascular disease on an average five years earlier than those without hypertension.[1] Hypertension is a strong predictor of CVD and stroke. CKD is the consequence of both uncontrolled HTN and uncontrolled DM[4]. Approximately 80-85% CKD patients will develop hypertension[5].

Proper control of blood pressure is necessary to prevent IHD, stroke and kidney damage as well as other health problems.[6,7] Reaching an optimal blood pressure level is difficult in CKD patients because of increasing CKD stages and decreasing GFR.[8] Hypertension management is a prime target of intervention in CKD patients. Monitoring and improving drug compliance would be a very important tool to achieve an optimal blood pressure goal. To prevent complications of hypertension in CKD patients regular intake of prescribed medication is essential. Poor compliance to antihypertensive therapy is usually associated with bad outcomes of the disease.[9] Compliance to anti-hypertensive medication has importance to prevent premature death, to reduce treatment cost and to improve life expectancy.[9] Patients noncompliance to treatment is a predominant factor for failing to control hypertension.[10]

Method:

After taking clearance from institutional ethical review committee this observational cross-sectional study was conducted in the department of Nephrology of Dhaka Medical College Hospital, Dhaka from January 2022 to December 2022. The aim of the study was to determine the proportion of treatment compliance among hypertensive chronic kidney disease patients to identify socio-demographic, behavioral and clinical factors associated with treatment compliance. Total 264 hypertensive CKD patients of either gender, aged between 18 to 78 years, diagnosed as per KDIGO, 2012 guideline to have CKD with hypertension with or without comorbidities were included in this study. Aims, objectives and procedures of the study was explained with understandable language to the patient. Informed written consent was taken from each patient. Structured data collection tool was used to collect patients' information like-socio-demographic and behavioral characteristics, clinical history, blood pressure and prescribed antihypertensive medication and other relevant data were collected according to the objectives of the study. Staging of CKD was performed by using estimated glomerular filtration rate (e-GFR). e-GFR was calculated by using CKD-EPI equation with the help of e-GFR calculator. Blood pressure was measured as per JNC-8 guideline. Two readings of blood pressure about five minutes apart from first reading was taken and the average of two readings was recorded. Collected data were processed and analyzed by using SPSS (Statistical Package for the Social Sciences) 26.0. p value of < 0.05 was taken as statistically significant.

Result:

Among 264 CKD patients 58% were male and 42% were female and male: female ratio was 1.4:1. Patients between 18-80 years of age were included in this study, 27.2% were in 51-60 years age group, and no significant association between age and gender of patients to medication compliance (p=>0.05) was observed in Table-I. In Table-II 70.2% patients had history of taking antihypertensive for >1 year, 20.8% patients had taking antihypertensive for <1 year and no association between compliance and duration of antihypertensive therapy was found (p=0.12). 38.2%, 36.7% and 14.39% patients were taking two drugs, three drugs and one drug therapy respectively and only 1.13% were taking traditional medicine. Significant relationship between compliance to patients taking three drugs combination therapy and taking traditional therapy (p=0.001) was found in Table-II. 70.1% patients were on regular health care checkup and significant association between compliance and patients on regular follow up (p=0.001) was found in Table-I. Optimal level of blood pressure (<140/90 mm of Hg) was achieved in 32.1% cases. Patients with controlled hypertension were compliant to antihypertensive therapy (p=0.001). Most of the patients (72%) were in later stage of CKD and significant association between stages of CKD (stage-4 & stage-5) and medication compliance (p=0.019 & p= 0.045) was observed in Table-II. Association of compliance to patients clinical history and antihypertensive therapy was observed in Table II. 67.8% patients were compliant to antihypertensive medication and 71.6% were compliant to life style modification practice. Medication compliance was significant in patients who were taking drugs regularly (p=<0.001). 32.2% were noncompliant to therapy and to lifestyle modification , among them 38.2% patient were taking table salt regularly, 18.9% were smoker,

DOI:https://doi.org/10.3329/jcomcta.v29i1.81465

18.2% skipped medication because they feel better after starting medication and 19.3% stop medication because of side effects and medication cost (4.1%) and 28.1 % patients were physically inactive. Significant association was found between these factors and compliance (p=0.001)

Table-I: Association of social-demographic and behavioral characteristics of patients to treatment compliance

Variables	Compliance (n=195)	Non -compliance (n=69)	Total (n=264)	P–value
Age(years)				
18-30	31(15.9)	6(8.7)	37	
31-40	30(15.4)	11(15.9)	41	
41-50	42(21.5)	13(18.8)	55	
51-60	53(27.2)	19(27.5)	72	0.087
61-70	34(17.4)	18(26.1)	52	
71-80	5(2.6)	2(2.9)	7	
Gender				
Male	113(57.9%)	40(58%)	153	0.99
Female	82(42.1%)	29(42%)	111	0.45
History of smoking				
Yes	02	48	50(18.9%)	
No	193	21	214(81%)	0.001
Table Salt intake				
Yes	35	66	101(38.2%)	
No	160	3	164(62.1%)	0.0001
Use of traditional medicine				
Yes	01	02	03(1.1%)	
No	194	67	261(98.9%)	0.0001
Health facility distance				
Yes	18	61	79(29.9%)	0.001
No	177	08	185(70.1%)	

Table-II: Relation of Compliance to patients clinical history and antihypertensive therapy

Variables	Compliance (n=195)	Non-compliane (n=69)	Total (n=264)	P –value
Duration of taking Antihypertensive therapy				
6 months – 1 yr	29	26	55(20.8%)	0.12
More than 1yr	166	43	209(70.2%)	
Stages of CKD				
Stage1	2(1.0%)	0(0.00%)	2(0.75%)	0.398
Stage2	10(5.1%)	3(4.3%)	13(4.9%)	0.796
Stage3	42(21.5%)	17(24.6%)	59(22.3%)	0.595
Stage4	29(14.9)	19(27.5%)	48(18.8%)	0.001
Stage5	112(57.4%)	30(43.5%)	142(53.8%)	0.045
No of antihypertensive drug used				
One drug	21(10.8%)	17(24.6%)	38(14.39%)	0.305
Two drug	71(36.4%)	30(43.5%)	101(38.2%)	0.299
Three drug	83(42.65)	14(20.3%)	97(36.7%)	0.001
Four or more drug	20(10.3%)	8(11%)	28(10.6%)	0.756
Blood pressure control				
Controlled	62(3.4%)	23(9.4%)	85(32.1%)	<0.001
Un-controlled	07(22.7%)	172(64.3%)	179(67.8%)	
Forget to take medication				
Yes	16(6%)	47(17.8%)	63(23.9%)	<0.001
No	179(67.8%)	22(8.3%)	201(76.1%)	
Stop medication because of feeling better				
Yes	08	40	48(18.2%)	<0.001
No	187	29	216(81.8%)	
Stop taking medication because of side effects				
Yes	3	48	51(19.3%)	0.0001
No	192	21	213(80.3%)	
Stop medication because of medication cost				
Yes	4	7	11(4.1%)	0.001
No	191	62	253(95.85)	

Discussion:

Management and control of HTN is a major challenge in CKD patients that necessitates attention to medication compliance and lifestyle modification. WHO rates poor compliance to antihypertensive therapy as the main reason for uncontrolled hypertension. Good compliance with anti-hypertensive therapy has proved to control hypertension and to reduce related risk of complication[11]. In this study 67.8% patients were compliant to antihypertensive therapy and 71.6% were compliant to healthy lifestyle modification practices. In a similar study of Sekhar et al[12] and Rao et al[13] have 74.2% & 82.2% medication compliance respectively but the study of Moss et al[14] and Khawaja et al[15] was non-comparable to this study. In their study, compliance with medication & lifestyle modification was 14.6% and 31.5% respectively. This may be due to differences in sociodemographic characteristics of the study area.

DOI:https://doi.org/10.3329/jcomcta.v29i1.81465

Here in this study, 48.7% of patients were in 41-60 years age group and no significant association was found between age and gender of patients to medication compliance (p=>0.05). This study was non-comparable to the study of Khawaja et al[15] and Moss et al[14] where 18-28 years age group patients were more compliant with therapy.

There was no significant correlation between the length of antihypertensive therapy and compliance, 70.2% of patients had been taking antihypertensives for more than a year, and 20.8% had been taking them for less than a year. The study of Ahmed et al[16] and Moss et al[14] have similar findings. Here in this study 70.1% patients were on regular health care checkup and significant association was found between compliance and patients on regular follow up(p=0.001).

In this study, significant association was found between medication compliance to patients having three drugs (36.7%) combination therapy (p=0.001), which was non-comparable to the study of Moss et al[14], where 87% patients were taking two drugs combination therapy. This difference may be due to CKD stages and presence of comorbidities.

Optimal level of blood pressure (<140/90 mm of Hg) was controlled in 32.1% cases and significant association was found between medication compliance and BP control, which coincides with the study of Ahmed et al[16], Schmitt et al[17] and Khawaja et al[15]. In this study most of the patients (72%) were in later stage of CKD and significant association between stages of CKD (stage- 4 & stage-5) and medication compliance (p=0.001) was observed but this is non-comparable to the study of Schmitt et al[17].

Here in this study, medication compliance was significant in patients taking drugs regularly (67.8%) and practicing a healthy lifestyle (71.6%) that means who avoid smoking, table salt intake & perform some sort of physical exercise regularly (p=0.001). This study coincides with the study of Ahmed et al[16]. In this study major causes of patients noncompliance was physical inactivity (28.1%), regular intake of table salt (38.2%), smoking (18.9%), skipping of medication 6because of feeling better (18.2%), because of side effects of medicine (19.3%) and medication cost (4.1%) and these factors were comparable to the study of Ahmed et al[16] and Moss et al[14] .

Conclusion:

Maintaining a healthy lifestyle and taking their medication on a regular basis might assist hypertensive CKD patients in reaching their blood pressure goal and avoiding the risks of uncontrolled hypertension. Smoking, intake of table salt, skipping of medication, physical inactivity, cost of medication, insufficient health care follow-up were risk factors of compliance. To increase compliance, patient counseling is advised.

References:

1. Khan MN, Oldroyd JC, Chowdhury EK, Hossain MB, Rana J, Renzetti S, Islam RM. Prevalence, awareness, treatment, and control of hypertension in Bangladesh: Findings from National Demographic and Health Survey, 2017–2018. The Journal of Clinical Hypertension. 2021 Oct;23(10):1830-42.

2. Sarker MH, Moriyama M, Rashid HU, Chisti MJ, Rahman MM, Das SK, Uddin A, Saha SK, Arifeen SE, Ahmed T, Faruque AS. Community-based screening to determine the prevalence, health and nutritional status of patients with CKD in rural and peri-urban Bangladesh. Therapeutic Advances in Chronic Disease. 2021 Jul;12:20406223211035281.

3. Bikbov B, Purcell CA, Levey AS, Smith M, Abdoli A, Abebe M, Adebayo OM, Afarideh M, Agarwal SK, Agudelo-Botero M, Ahmadian E. Global, regional, and national burden of chronic kidney disease, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. The lancet. 2020 Feb 29;395(10225):709-33.

4. Sarafidis PA, Li S, Chen SC, Collins AJ, Brown WW, Klag MJ, Bakris GL. Hypertension awareness, treatment, and control in chronic kidney disease. The American journal of medicine. 2008 Apr 1;121(4):332-40.

5. Kalaitzidis RG, Elisaf MS. Treatment of hypertension in chronic kidney disease. Current hypertension reports. 2018 Aug; 20:1-0.

6. World Health Organization (WHO), 2021, Hypertension. Available from: http:// www.who.int/news-room/fact-sheets/detail/hypertension.

7. Pugh D, Gallacher PJ, Dhaun N. Management of hypertension in chronic kidney disease. Drugs. 2019 Mar 1;79(4):365-79.

8. Prabitha P, Reshmi TR, KP J. Analysis of prescription pattern of antihypertensives in various stages of chronic kidney disease. International Journal of Basic & Clinical Pharmacology. 2019 Mar;8(3):524.

9. Lv JC, Zhang LX. Prevalence and disease burden of chronic kidney disease. Renal fibrosis: mechanisms and therapies. 2019:3-15.

10. Sharkness CM, Snow DA. The patient's view of hypertension and compliance. American journal of preventive medicine. 1992 May 1;8(3):141-6.

11. Asgedom SW, Atey TM, Desse TA. Antihypertensive medication adherence and associated factors among adult hypertensive patients at Jimma University Specialized Hospital, southwest Ethiopia. BMC research notes. 2018 Dec;11:1-8.

12. Sekhar KC, Sharma EM, Rao KU, Chaitanya CK, Reddy BH, Deotale PG. A Study On Anti Hypertensive Drug Compliance Among Hypertensive Individuals At Ashok Nagar Urban Area Of Eluru, Andhra Pradesh. Journal of Comprehensive Health. 2016 Jan 1;4(1):41-8.

13. Rao CR, Kamath VG, Shetty A, Kamath A. Treatment compliance among patients with hypertension and type 2 diabetes mellitus in a coastal population of Southern India. International journal of preventive medicine. 2014 Aug;5(8):992.

14. Moss JT, Kimani H, Mwanzo I. Compliance to antihypertensive therapy and associated factors among adults' hypertensive patients attending medical clinics in Kilifi County Kenya. Int J Commun Med Public Health. 2021 Oct;8(10):4655-65.

15. Khwaja M, Ansari MA, Mehnaz S. Compliance to antihypertensive medication: A cross-sectional study in aligarh. International Journal of Community Medicine and Public Health. 2017 Sep 22;4(10):3698-704.

16. Ahmed N, Abdul Khaliq M, Shah SH, Anwar W. Compliance to antihypertensive drugs, salt restriction, exercise and control of systemic hypertension in hypertensive patients at Abbottabad. J Ayub Med Coll Abbottabad. 2008 Apr 15;20(2):66-9.

17. Schmitt KE, Edie CF, Laflam P, Simbartl LA, Thakar CV. Adherence to antihypertensive agents and blood pressure control in chronic kidney disease. American journal of nephrology. 2010 Nov 2;32(6):541-8.

DOI:https://doi.org/10.3329/jcomcta.v29i1.81465