Research Article

Study of Antihypertensive Use in Elderly Subjects with or Without Comorbid Conditions in A Tertiary Care Hospital

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ABSTRACT

Hypertension is the commonest cardiovascular disorder, with the prevalence progressively increasing with age and elderly subjects are more prone for various hypertension-related complications. Presence of various co-morbid conditions influences the choice and dose of antihypertensive medications. Persistent adherence to the prescribed medications and lifestyle measures are very essential to reduce the morbidity and mortality, and to improve the QOL. The objective of the study is to determine the pattern of antihypertensive prescribing, to assess the medication compliance and Quality of life. 250 elderly hypertensive subjects of either gender were recruited in to the present study to assess the prescribing pattern of antihypertensives; details of drug therapy, therapeutic class, dose, route, frequency, duration of administration. The compliance was 8-item questionnaire as per Morisky Medication Adherence Scale and the Quality of life was assessed using MINICHAL Instrument, consisting of 17-item questionnaire. The most commonly prescribed antihypertensives were angiotensin receptor blockers (55%) and calcium channel blockers (55%) and, angiotensin receptor blocker + thiazide diuretic combination was the commonest dual antihypertensive therapy prescribed. 41.2% subjects had good level of medication compliance, 48.4% subjects had moderate level of compliance and 10.4 % subjects had poor level of compliance. The mean total scores of the HRQoL scale in the subjects with pre hypertension was 26.20±8.01, 25.66±9.38 in subjects with stage 1 HTN and 29.36±8.66 in subjects with stage 2 HTN. The most common antihypertensives were angiotensin receptor blockers and calcium channel blockers. The level of compliance was influenced by factors such as age, gender, co morbidities, severity of hypertension and number of medications. HRQoL of the study population was influenced by severity of hypertension.

Keywords: antihypertensives, Morisky Medication Adherence Scale, MINICHAL Instrument.

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INTRODUCTION

Hypertension is the commonest cardiovascular disorder, with the prevalence progressively increasing with age and elderly subjects are more prone for various hypertension-related complications.[1] Hypertension in elderly is a major risk factor for cardiovascular morbidity and mortality, which include coronary heart disease (CHD), congestive heart failure (CHF), ischemic and hemorrhagic stroke, renal failure, and peripheral arterial disease. The presence of various co-morbid conditions like diabetes mellitus, ischemic heart disease, cardiac failure, renal dysfunction, etc, may influence the choice of antihypertensive medications (may favor or limit the use of particular antihypertensive drug) and dose individualization.[2] Hypertension is often asymptomatic chronic disease, which requires optimal control of blood pressure with persistent adherence to

prescribed medications and lifestyle measures, which are very essential to reduce the morbidity and mortality, and to improve the quality of life.[3] Poor adherence among older persons is a public health concern, as it accounts for adverse outcomes, medication wastage with increased cost of healthcare, and substantial worsening of the disease with increased disability or death. Quality of life helps to assess the benefits and risk of medication and provides valuable feedback to physician thus promoting safe and effective use of drugs in the elderly.[3] The choice of antihypertensive therapy in elderly should be optimized to the given situation depending on the type and severity of hypertension, presence of comorbid conditions, and extent of end-organ damage, tolerability and cost-effectiveness of the medications.[4] Though there are standard guidelines for the choice of appropriate therapy of hypertension in geriatric age group, there is inconsistent data from the developing countries regarding the actual implementation of the therapeutic guidelines, and hence there is a need for more systematic studies. As there are few studies reported in the Indian literature to assess the prevailing pattern of prescribing antihypertensive drugs, compliance to the prescribed medications and the impact of therapy on the quality of life in elderly age group, the present study was taken up.

MATERIALS AND METHODS

Following IEC approval and clearance (KIMS IEC/D-6/2015), 250 elderly hypertensive subjects of either gender aged > 60 years fulfilling the inclusion and exclusion criteria were included for the present study by purposive sampling method. This study was carried out from January 2016 – June 2017 (18 months) involving 250 consecutive subjects with hypertension, with or without comorbid conditions. A detailed present and past medical, personal (including life style), family and drug history, were recorded from all the study subjects. The available medical records of the subjects were thoroughly scrutinized to obtain any relevant information about the comorbid conditions, concomitant medications for comorbid conditions were recorded. The details of the ongoing antihypertensive therapy including the number of drugs or drug combinations used, the therapeutic class, dose, frequency and duration of administration were documented. The compliance to the prescribed medications was assessed by an 8-item questionnaire as per **Morisky Medication Adherence Scale (MMAS).[5]** Quality of life was assessed by using **MINICHAL** Instrument,[6,7] consisting of 17-item questionnaire. The data collected was analyzed by using descriptive statistics, namely mean, standard deviation, t-test, chi-square test. The results were also depicted in the form of tables and graphs. Microsoft Word and Excel are used to generate graphs and tables.

RESULTS

The demographic data of the study subjects is presented in the **Figure-1**. The mean age for males was **68.3±4.2** years and for females was a **67.25±3.9** years. Majority of the subjects (71.6%) were in the age group between 60-70 years, and 6.4% of subjects were aged above 81. The prescription pattern of antihypertensive agents is summarized in **Table-1**. 55 % of the subjects received ARB, 55 % CCB, 24.8% beta blocker, 22.8% thiazide diuretic, 7.6% ACEI, 5.2% thiazide like diuretic, 3.2% loop diuretic,

2.4% potassium sparing diuretic, 2% alpha blocker and 0.9% subjects received other antihypertensive medication (clonidine). **Table-2** summarizes the duration and severity of hypertension and the level of compliance. Among the study subject's 55.2% presented with the history of hypertension for more than 5 years. 47.6% subjects (n=119) were categorized under stage 1 hypertension, 32.8% subjects (n=82) under pre hypertension category and 19.6% subjects (n = 49) with stage 2 hypertension. The level of medication compliance was good in 41.2% subjects, moderate in 48.4% subjects and poor in 10.4% subjects. The factors affecting medication compliance are presented in **Table-3.** The level of compliance was influenced by various factors such as age, gender, co morbidities, severity of hypertension and the number of medications. Health related quality of life in the study subjects **was summarized in Table-4.** The mean total scores of MINICHAL scale in the subjects prescribed with ARB + Thiazide diuretic was 26.81±8.92 and in the subjects prescribed with CCB + Beta blocker was 26.27±8.04. The difference in the mean total scores of MINICHAL scale between these two groups was not statistically significant.
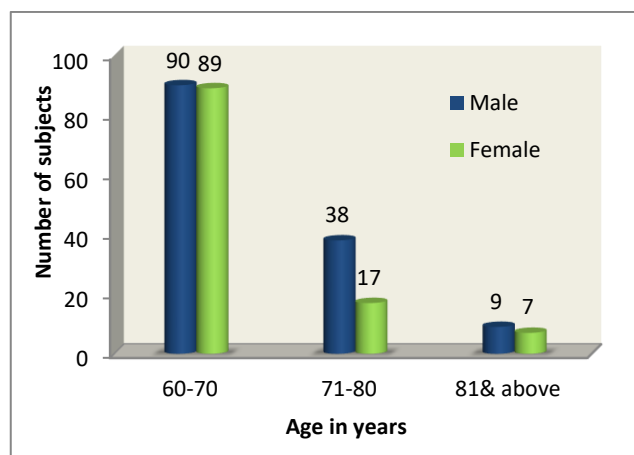

Figure 1: Age & Gender Distribution (n=250)

Table 1: Prescribed Medications/Ongoing Therapy for Hypertension (n=250)

Antihypertensive class		No. of subjects (%)
Diuretics	Thiazide diuretic (Hydrochlorothiazide)	57(22.8)
	Thiazide like diuretic (Chlorthalidone, Indapamide)	13(5.2)
	Loop diuretic (Furosemide, Torsemide)	8(3.2)
	Potassium sparing diuretic (Spironolactone, Amiloride)	6(2.4)
ACEIs (Ramipril, Enalapril, Perindopril)		19(7.6)
ARBs (Losartan, Telmisartan, Olmesartan)		121(55)
CCBs (Amlodipine, Cilnidipine, Nifedipine)		121(55)
β-blockers (Propranolol, Metoprolol, Atenolol, Carvedilol, Nebivolol)		62(24.8)
α-blockers (Prazosin)		5(2)
Others (Clonidine)		2(0.9)

ACEIs- Angiotensin converting enzyme inhibitors, ARBs- Angiotensin receptor blockers, CCBs- Calcium channel blockers

Table 2: Duration and Severity of Hypertension and the Level of Compliance (n=250)

Duration of HTN	n(%)
>0.5 years	45(18)
>2 years	67(26.8)
>5 years*	138(55.2)
Total	**250(100)**
Severity of hypertension	**n(%)**
Pre-hypertension	82(32.8)
Stage1	119(47.6)
Stage 2	49(19.6)
Total	**250(100)**
Level of compliance	**n(%)**
Good	103(41.2)
Moderate	121(48.4)
Poor	26(10.4)
Total	**250 (100)**

DISCUSSION

In the present study, the prescription pattern of antihypertensive use, medication adherence and quality of life were assessed in 250 elderly hypertensive subjects who attended the medicine outpatient department at KIMS Hospital and Research Centre, a tertiary care teaching hospital. Majority of the study subjects were male and the relative male preponderance was also observed in other studies.[7,8] However, some studies have reported a relatively higher incidence of hypertension in females than in males.[9] ARBs and CCBs were the most prescribed antihypertensive agents in the present study and similar observation was made in many other studies.[9,10,11] The stage of hypertension in the subjects was categorized as per JNC 8 classification for hypertension in elderly and the similar result was found in other study.[12] In our study the difference in the compliance level between the different age groups is found to be statistically significant with p-value of 0.02. Good adherence level to medication was observed more in subjects of age group 60-70 years and poor medication adherence level was seen more in subjects of age group 81 & above. This result showed that the adherence level decreased with increasing age and similar results has been found in other studies. [3,13,14] Thus, based on the observation made from the present study, it can be concluded that age appears to be an important factor to influence compliance level. Among the study subjects' high level of compliance was seen in females compared to males, this difference in the compliance level between male subjects and female subjects is statistically significant (p value <0.001). Few other studies have also found the similar results.[13, 14,]

Table 3: Factors Affecting the Level of Compliance (n=250)

Age in years	Compliance level - n(%)			Total	p value*
	Poor	Moderate	Good		
60-70	18	78	81	177(100)	
71-80	3	31	21	55(100)	0.02009
81 & above	5	10	3	18(100)	
Gender					
Male	21	69	47	137	<0.0000001
Female	5	52	56	110	
Co morbidities					
With co morbidities	7	25	43	75	0.002591
Without co morbidities	19	96	60	175	
Duration of hypertension					
>0.5 years	4	22	19	45	
>2 years	9	30	28	67	0.8934
>5 years	13	69	56	138	
Severity of HTN					
Pre hypertension	7	33	42	82	
Stage 1	5	61	53	119	0.000002215
Stage 2	14	27	8	49	
Number of medications					
Up to 3	17	73	93	183	0.000001886
>3	9	48	10	67	

*chi-square test

Table 4: Health Related Quality of Life- Antihypertensive Agents & HRQoL

Antihypertensive agent	ARB+TD (22)	CCB+ β – blocker (22)	*p* – value*
Total score (Mean ± SD)	26.81 ± 8.92	26.27 ± 8.04	0.638
Mental symptom score (Mean ± SD)	14.04 ± 5.58	13.36 ± 4.07	0.156352
Somatic symptom score (Mean ± SD)	10.72 ± 3.87	10.87 ± 4.51	0.489123

*t-test (two tailed)

Poor level of compliance was seen more in subjects with co morbidity as compared to subjects without co morbidity. This indicates that there is positive association between the presence of co morbidities and poor level of compliance (p=0.002). similar observation was reported from a study conducted by Zahra Saadat, et al.[15] The presence of co morbidities further adds to the problem of increased economic burden.

Positive correlation between the duration of hypertension and level of compliance was not seen in the study. The difference in the level of compliance between stages of hypertension is statistically significant (p<0.001), indicating the level of compliance is influenced by the severity of hypertension in the present study. In contrast to the observations made in the present study, increased adherence with stage 2 hypertension has been reported in other study.[16] The association between the number of medications with the level of compliance was found to be positive with the statistically significant p-value of <0.001. Pill burden was found to be a major factor influencing compliance in the present study. Similar results were seen in a study done by J. Venkatachalam and colleagues.[14] The difference in the mean total scores of the HRQOL scale between the stages of hypertension was found to be statistically significant (p<0.05). This indicates that there is a positive association between HRQoL and severity of hypertension. This result was analogous to results of other studies.[17] These findings are discordant with those reported by Li et al.,[18] who found higher HRQoL in controlled hypertensive patients compared with uncontrolled hypertensive patients under drug treatment. But we did not find any significant difference in the mean mental symptom scores and mean somatic symptom scores between the subjects with different stages of HTN in the present study. Even though patients with elevated blood pressure mostly have no physical symptoms they may have behavioral or emotional impairment which lowers their quality of life.[17] This study is limited by sampling method and technique.

CONCLUSION

The presence of co-morbid and stages of hypertension influence the choice of antihypertensive medications and dose individualization. In our study most common antihypertensives used were angiotensin receptor blockers and calcium channel blockers. Factors such as age, gender, co morbidities, severity of hypertension and number of medications have influenced the level of compliance in our study subjects. HRQoL of the study population was influenced by severity of hypertension.

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