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Research Article

EVALUATION OF ANTIHYPERTENSIVE AGENT CHOICE IN OUR INTERNAL MEDICINE CLINIC INPATIENTS

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ABSTRACT
The aim of this study was to assess the choice of anti-hypertensive drugs in patients with uncomplicated and complicated hypertension at Haseki Training and Research Hospital, internal medicine clinic, and its comparison with current international guides. Retrospectively studied 339 patients hospitalized in our clinic including 167 female and 172 male were evaluated. 88.2 % patients had hypertension and the rate of other co-morbid diseases was as follows: 48.2% diabetes Mellitus and coronary artery disease was present in 41.3%, Cerebrovascular disease in 14.5% and chronic kidney disease in 17.4%. Anti-hypertensive medications increased after hospitalization and the change was statistically significant. Following drugs were used; beta- blockers 50.1% diuretics 45.4%, calcium-channel blockers 35.7%, angiotensin-converting enzyme inhibitors 28.3%, the combination 6.2%, alpha blockers 3.8%, angiotensin receptor blockers 2.1%. Hospital admissions lead to an increase in the use of hypertensives. In clinical practice, international guidelines were followed. In conclusion, it should be kept in mind that anti-hypertensive treatment is lifelong and it should be updated constantly especially when there are accompanying co-morbid disorders.

Keywords: *Hypertension, Antihypertensive Treatment, Complication*

INTRODUCTION
Arterial hypertension is the most common chronic disease in developed countries and in primary care and it is the leading risk factor for stroke, coronary heart disease, congestive heart failure, chronic renal failure and peripheral artery disease (James *et al.,* 2014). It's prevalence appears to be about 30-45% of the general population (Pagliaro *et al.,* 2016).

Hypertension is a major cardiovascular risk factor, nevertheless control rates remain suboptimal (Axon *et al.,* 2011). Complicated hypertension is associated with increased cardiovascular risk and hence, the prescription of effective anti-hypertensive treatment often requires using more than one anti-hypertensive drug (Ko *et al.,* 2015).

The aim of anti-hypertensive therapy, in addition to reducing raised blood pressure, is to prevent cardiovascular events (Chen *et al.,* 2012).

Blood pressure control is associated with a significant decrease in the risk of coronary artery disease (CAD), stroke and chronic kidney disease (CKD) (Chrysant, 2016). Determination of anti-hypertensive treatment practices in complicated and non-complicated inpatients with hypertension, will contribute to the evaluation of our approach in view of international guidelines.

MATERIALS AND METHODS
Methods
The sample of this retrospective study included patients hospitalized in an Internal medicine clinic. Patients were on hypertensives at the time of admission. Co-morbid diseases were investigated in these patients such as diabetes mellitus (DM), coronary arter disease (CAD), chronic renal failure (CRF),

peripheral artery disease (PAD). Demographic information (age, sex, co-morbid diseases), were recorded in electronic media. Drugs used for the prevention and treatment of hypertension were angiotensin converting enzyme inhibitors (ACEI), angiotensin receptor blockers (ARB), beta blockers (BB), diuretics (DU), calcium channel blockers (CCB), combined preparations and alpha blockers (AB), as stated in the guideline.

For statistical analysis, SPSS 15.0 for windows program was used. Descriptive statistics were expressed with number and percentage for categorical variables and with mean standard deviation and minimum, maximum for numerical variables. The relation of categorical variables with independent groups was tested with chi square analysis. Categorical dependent variables were evaluated with McNemar test. p value of <0.05 was considered statistically significant.

RESULTS AND DISCUSSION

Results

Overall, 339 inpatients in whom anti-hypertensive treatment was initiated were included in the present study. Mean age was 69.9 ± 12.8 and 172 patients were male and 197 female. 88.2% of the patients was hypertensive. The rate of co-morbid diseases was as follows: 48.2% DM, 41.3% CAD, 5% CVD, 17.4% CRF, 6.8% PAD.

Mean duration of hospitalization was 9.5±6, 2 days. The rate of hypertensive use was 29.5% prior to hospitalization, while it was 90.6% after hospitalization. The increase in the use of anti- hypertensive drugs was statistically significant (p<0,001).

7 patients died during hospitalization. The hypertensives used before admission was in decreasing order of frequency were as follows: ACEI 28.3%, BB 12.1%, CCB 11.8%, DU11.2% combined drugs 6.2%, AB 3.8% and ARB 2.1%.

The hypertensives used after admission were in decreasing order of frequency as follows: BB 50.1% DÜ 45.4%, CC 35.7%, ACEI 28.3%, combined drugs 6.2%, AB 3.8% and ARB 2%. Among the drugs, increase in the rate of ACEI, CCB, BB and DU use was statistically significant (in all p<0.001). In different co-morbid disease groups, in those with coronary artery disease (CAD), the rate of the use of beta-blockers and diüretics before admission and the rate of beta blockers and diuretics after admission were significantly higher than in those without CAD.

Table 1: Prehospitalization Values of Patients

Age, mean		69,9±12,8 (18-98)
Gender, female (%)		167 (49,3)
Chronic disases, n (%)	HT	229 (88,2)
	DM	164 (48,5)
	CAD	140 (41,3)
	CVD	49 (14,5)
	CRF	59 (17,4)
	PAD	23 (6,8)
Antihypertensive medication before hospitalisation, n (%)		100 (29,5)
Antihypertensive medication after hospitalisation, n (%)		307 (90,6)
Hospitalisation day, median (min-maks)		9,5±6,2 (1-37)

In those with CRF, the rate of ACEI was significantly lower than that in patients without CRF and after admission, the rate of the use of CCB, AB, DU was significantly higher. Hypertensive patients with co-morbid DM and CAD, after admission, the rate of the use of ACEI, CCB and BB increased significantly compared to pre addmission period.

(p<0.001) in CVD and CRF, the use of CCB, BB and DU increased. In CRF, the increase in the use of CCB and BB and in those with only hypertension, increase in the use of ACEI, CCB, BB and DU was statistically significant.

Table 2: Disease Group and Drug Use Ratio (Before and After Hospitalization)

	DİABETES				**CAD**				**CVD**		
	Before Hospitalization		**After Hospitalization**		**Before Hospitalization**		**After Hospitalization**		**Before Hospitalization**		**After Hospitalization**
	N	%	N	%	n	%	N	%	n	%	N
ACEI	18	11,0	49	29,9	16	11,4	48	34,3	6	12,2	14
ARB	3	1,8	3	1,8	2	1,4	2	1,4	1	2,0	0
CCB	20	12,2	62	37,8	15	10,7	43	30,7	9	18,4	21
BB	24	14,6	89	54,3	27	19,3	94	67,1	7	14,3	29
AB	5	3,0	5	3,0	4	2,9	4	2,9	0	0,0	2
DU	20	12,2	70	42,7	24	17,1	76	54,3	5	10,2	21
Combination	16	9,8	8	4,9	15	10,7	4	2,9	7	14,3	5

Table 3: Disease Group and Drug Use Ratio (before and after Hospitalization)

	CRF				**HT**				**PAD**		
	Before Hospitalization		**After Hospitalization**		**Before Hospitalization**		**After Hospitalization**		**Before Hospitalization**		**After Hospitalization**
	N	**%**	**N**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**N**
ACEI	3	5,1	5	8,5	34	11,4	81	27,1	4	17,4	6
ARB	0	0,0	1	1,7	7	2,3	7	2,3	0	0,0	1
KKB	7	11,9	32	54,2	39	13,0	110	36,8	5	21,7	8
BB	7	11,9	35	59,3	38	12,7	146	48,8	5	21,7	14
AB	1	1,7	6	10,2	4	1,3	11	3,7	0	0,0	1
DU	10	16,9	34	57,6	34	11,4	129	43,1	2	8,7	12
Combination	2	3,4	4	6,9	28	9,4	18	6,0	4	18,2	3

Discussion

Patients in the present study were those who have been admitted to internal medicine clinics for various causes and administered hypertensive drugs during admission treatment. Their co-morbid diseases were also determined. Hypertension remains one of the most important preventable contributors to disease and death. Plenty of evidence from randomized controlled trials has shown benefit of anti-hypertensive drug treatment in decreasing important negative health outcomes in people with hypertension (James *et al.,* 2014). The prevalence of hypertension and cardiovascular risk factors among inpatients appears to be high with a rate over 50 % (Axon *et al.,* 2010). Hypertension and related complications including congestive heart failure, coronary heart disease, stroke and end stage renal disease, rises sharply as a function of advancing age, whereas blood pressure control declines with longevity in most demographic groups (Egan *et al.,* 2003). The guidelines corroborated that DU, BB, CCB, ACEI and ARB's are suitable for the initiation and maintenance of anti hypertensive treatment as mono therapy or in combination therapy (Pagliaro *et al.,* 2016). In the choice of anti hypertensive drugs, co-morbid diseases of the patients should also be taken into account. Suitable anti hypertensives should be judiciosly administered to patients in accordance with guidelines. We based our investigation on the drugs administered to hypertensive patients with co-morbid diseases. We first assessed whether they were hypertensive. Then, we investigated drug choices in co-morbid DM, CAD, CVD and CRF, whatever the cause of admission is. The aim here was to determined if the treatment regimen already used and the treatment we administered after admission were in accordance with the recommendations of guidelines. We wanted to evaluate this retrospectively. In the present study, BB use was found to be increased, suggesting that in elderly hypertensive patients with high mean age, the presence of CAD, heart failure and cardiovascular diseases was associated with the increase. BB are among the most commonly used medications in the treatment of hypertension. The use of beta adrenergic blockers in hypertension is associated with a significant reduction cardiovasculer morbidity and mortality in younger patients but should not be considered for first line therapy in older patients (Larochelle *et al.,* 2014). Hypertension and diabetes are becoming increasingly common. Clinical trials have revealed the importance of strict blood pressure control among patients with diabetes (Answer *et al.*, 2011). In our patients, the rate of DM co-morbid with hypertension was 48.2 %. Retrospective data analysis from trials shows a linear relationship between either baseline or achieved study blood pressure and progression of nephropathy. At present, in the management of hypertension in diabetic patients the use of ACEI or ARB therapy for those with more than 300 mg of albuminuria are imperative (Sternlicht and Bakris, 2016).

Antihypertensive drugs used in diabetic patients were ACEI, CCB and BB. There is evidence in the publications that ACEI and ARB decrease the rate of cardiovascular events in hypertensive patients. In addition, ACEI and ARB contribute to the slowing of the progress of end stage renal failure. For the general population at the age of 18 Years or older with chronic kidney disease irrespective of race or diabetes status, patients with chronic kidney disease (CKD) and hypertension should receive ACEI or ARB as initial or add-on treatment to improve kidney functions. For the general black population with or without diabetes, initial anti hypertensive treatment should include a tiazide type diuretic or CCB (Farooq and Ray, 2014). Again in our diabetic patients, the use of ACEI's at admission increased. Similarly, calcium channel blockers decrease cardiovascular events in diabetic and hypertensive patients. Particularly dihidropiridin group CCB's reduce blood pressure markedly and may be combined with ACE I's and ARB's in order to decrease the progress of diabetic nephropathy. In diabetic hypertensive patients, RAS blockers, and in diabetic coronary artery patients, beta blocker employment is common in clinical practice. Arterial hypertension is the most important modifiable risk factor for stroke and all clinical manifestations of coronary artery disease (Weber *et al.,* 2016) and it is associated with an increased likelihood of subclinical or silent stroke. Up to 50 % of all strokes may be ascribed to hypertension. Blood pressure lowering itself appears to be decisive rather than choice of the antihypertensive drug (Sudano and Nägele, 2015). As a result of large metanalyses regarding hypertension treatment become available, antihypertensives employed and the options in complicated and uncomplicated hypertension treatment will become clearer and success in the treatment of this clinical process will increase.

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