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Full Length Research Paper

Pattern of drugs prescribed for treatment of hypertensive patients: Bangladesh

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The exponential increase in patients with hypertension puts an enormous burden on healthcare providers. To describe the trends in the prescription of antihypertensive medication in a tertiary care hospital, Bangladesh is the objective of the study. This is a hospital based descriptive cross sectional study conducted at the Medicine outpatient Department in Dhaka Medical College Hospital. Patients more than 20 years of age suffering from Hypertension were included in the study. Data was collected by interviewing using a semi-structured questionnaire and analysed by computer with the help of SPSS 16. A total hundred patients were included in the study and 61.6% patients were prescribed on single drug and 38.4% patients were prescribed on combined therapy. Among the prescriptions having single anti-hypertensive medication most commonly used drugs are Angiotensin Receptor Antagonist (37.3%), Calcium Channel Blocker (32.8%), and ACE Inhibitor (17.9%), Beta Blocker (6%), Alpha Blocker (3%), Thiazide and non-Thiazide Diuretics 1.5% each. Among the prescriptions having combined drug therapy Angiotensin Receptor Blocker along with Calcium Channel Blocker and Calcium Channel Blocker along with Beta Blocker were equally (28.1%) chosen by the physicians and use of Angiotensin Receptor Blocker along with Diuretics was 25%, ACE Inhibitor with Calcium Channel Blocker 3.1%, ACE Inhibitor with Diuretics 3.1%, Thiazide and Non Thiazide Diuretics was 3.1% and other drugs were used for 9.5%. Pattern of using antihypertensive medications varies according to presence of co-morbidities and duration but does not vary significantly between male and female patients.

Key words: Anti-hypertensive drugs, hypertension, prescription pattern, management of hypertension.

INTRODUCTION

Hypertension has been identified as the leading global risk factor for mortality and considered as the third contributing factor of disease burden worldwide that makes it a major public health challenge (Rodgers et al., 2004). Elevated blood pressure accounts for two-thirds and one-half of all cases of stroke and ischemic heart disease respectively. Prevalence of chronic kidney disease is about 22% among the undiagnosed hypertensive patients and 17% of pre hypertensive patients in the USA (Alam et al., 2014). The exponential increase in the patients with hypertension puts an enormous burden on both the healthcare authorities and

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healthcare providers. Eighty percent of this burden occurred in low socio economic and middle-income countries. Prompt and proper management of hypertension can significantly minimize the risk of stroke by 30-41% and of coronary heart diseases by 22%. Despite the availability of effective treatments, studies have shown that in many countries, less than 25% of patients treated for hypertension achieved optimum blood pressure. It is found that early detection, treatment, and control of hypertension are inadequate in low-income countries and awareness about hypertension is also low. Sometimes the situation is even worse (Khanam et al., 2014).

Bangladesh is passing through a phase of epidemiological transition from communicable diseases to non-communicable disease and currently has a double burden of disease (Moniruzzamani et al., 2013). This indicates that the prevalence of hypertension is modest now but will show a rising trend. But only a few studies were done to find out the actual prevalence of essential Hypertension in Bangladeshi people. According to a meta-analysis covering studies up to 1994 reported a prevalence of hypertension among the adult population of Bangladesh is 11.3% (Zaman et al., 2011). Though globally cardiologists play the major role for treating hypertension even at initial stage (Majumder, 2012) but the scenario of Bangladesh is slightly different in this aspect. The primary goal of the management of hypertension is to achieve the maximum reduction in the long-term total risk of cardiovascular morbidity and mortality (Mancia et al., 2007). But owing to unfavourable socio-economic condition most of the people in Bangladesh especially the poor or marginalized people do not consult cardiologist for the initial treatment of hypertension or uncomplicated hypertension. Rather they consult it with village doctors, drug seller and registered physician. Moreover, they are using public health facilities like outdoor services of different tertiary care hospitals. But it is essential to get the proper management of hypertension in due time as this phenomenon usually comes with co-morbid diseases like diabetes mellitus, heart disease, renal disease and other vascular, endocrine and metabolic disorders. Understanding the recent trends of the prescription pattern can be used by Government to ensure supply of appropriate drugs and also helps proper management of subsidies. Therefore, the current study was carried out with an objective to evaluate the Pattern of Drugs prescribed for treatment of hypertensive patients.

MATERIALS AND METHODS

Ethical consideration

The researcher was duly concerned about the ethical issues related to the study. Formal ethical clearance was taken from the ethical review committee of the ASA University Bangladesh for conducting the study as well as formal permission was taken from the responders. Confidentiality was maintained properly. Informed written consent was taken from the subject informing the nature and purpose of the study, procedure of the study, the right to refuse, accept and withdraw to participate in the study as well as the participants did not gain financial benefit from this study. The present study posed a very low risk to the participants, as procedures such as medical treatments, invasive diagnostics or procedures causing psychological, spiritual or social harm were not included.

Design and subjects

The current study was part of the Master of Public Health (MPH) thesis under the department of Public Health, ASA University Bangladesh. The descriptive, cross sectional study was conducted at Medicine Outpatient Department (OPD) of Dhaka Medical College Hospital (DMCH); which is a place where initial treatment is provided in hypertensive patients. Data were collected during the period of May 2015 to July 2015 from 100 patients by interviewing with a Bangla semi-structured questionnaire with non-probability purposive sampling. Patients suffering from hypertension above 20 years of age were included in the study. Participants, not willing to participate in the study and visited for the first time to the respective physician were excluded from the sample. After managing data properly it was analyzed in SPSS 16 version and Microsoft Excel Software 2007 version.

RESULTS

Data of 100 patients were collected and analyzed, of which 63% were male and 37% were female (Table 1). These patients were further categorized based on their age. 16% patient belonged to the age group 20 - 30 years, 37% patients were in the age group 31 - 40 years, 28% were in the age group 41-50 years, 14% patients were in the age group 51- 60 years, 3% patients were in the age group 61- 70 years and 2% patients were in the age group in between 71-80. The mean age is 37 ±11.3 years (Table 1).

Categorization on the basis of education level; 30% patients had completed their primary education, 27% completed their graduation, 23% taking higher secondary school certificate and 20% were illiterate. According to the monthly income, 42% study population had monthly income between 10000-20000 Bangladeshi Taka, 38% population had 21000-30000 taka, 13% population had 31000-40000 taka and only 7% population had monthly income between 41000- 51000 taka.

Among 100 study population 61.6% patients received monotherapy and 38.4% patients were prescribed combined therapy (Table 2) by the physicians for the management of hypertension. Among the mono-therapy mostly used drugs are Angiotensin Receptor Antagonist (ARA) (37.3%), Calcium Channel Blocker (CCB) (32.8%), and ACE Inhibitor (ACEI) (17.9%), Beta Blocker (BB) (6%), Alpha Blocker (AB) (3%) and Thiazide and non-thiazide diuretics 1.5% each (Table 3).

Among combination drug therapy ARB+CCB were used 28.1% and CCB+BB were also 28.1% and use of ARA + Diuretics were 25%, ACEI +CCB 3.1%, ACEI + Diuretics

Table 1. Distribution of respondent by demographic characteristics (N=100).

Demographic characteristics		%
Age (Completed years)	20-30	16.0
	31-40	37.0
	41-50	28.0
	51-60	14.0
	61-70	3.0
	71-80	2.0
	Mean ± SD (Range)	37 ±11.30
Sex	Male	63
	Female	37
Religion	Islam	92
	Hindu	8

Table 2. Treatment options for management of hypertension.

Treatment options (Number of drug used)	%
Mono-therapy (1-1)	61.6
Combination therapy (2)	34.3
Combination therapy) (3)	3.0
Combination therapy (>3)	1.0

Table 3. Frequency of different drugs used among monotherapy.

Class of the Drugs	%
ACE Inhibitor	17.9
Beta Blocker	6.0
Calcium Channel Blocker	32.8
Non Thiazide diuretics	1.5
Thiazide diuretics	1.5
Alpha Blocker	3.0
Angiotensin Receptor Blocker	37.3

Table 4. Frequency of different drugs used among combination therapy.

Class of the Drugs	%
ARB + Diuretics	25.0
ACEI + CCB	3.1
ACEI + Diuretics	3.1
CCB + Beta Blocker	28.1
Non Thiazide and Thiazide Diuretics	3.1
ARB + CCB	28.1
Others	9.5

Table 5. Duration of diagnosis of hypertension (N=100).

Duration	%
Less than 1 months	21.0
1 month -1 year	26.0
More than 1 year	53.0

3.1%, Thiazide and Non Thiazide Diuretics was 3.1% and other drugs was used for 9.5% (Table 4). Most prevalent comorbid disease were found are diabetes mellitus (21%), Angina (18%), Stroke or Transient Ischemic attack (TIA) (12%), High cholesterol (7%), Kidney disease (5%), Poor vision (3%) subsequently and 34% population had another associated disease (Table 6). About 53% population who were treated for hypertension with or without comorbid disease suffering from this condition on an average of more than 1 year (53%), 26% for one month to one year and 21% suffering for less than one month (Table 5) .

DISCUSSION

Hypertension has become a major health concern in low income countries. This study is one of the few studies that address the prescribing pattern of antihypertensive medications for the patients attending in outpatient department of Dhaka Medical College Hospital. We found an overall high prevalence of hypertension and low prevalence of awareness, treatment and control of the disease. The study highlighted mostly the hypertensive patients though different co morbid diseases like diabetes mellitus, angina, TIA/stroke, renal disease and others were also considered as associated conditions. This survey was conducted in a short period of three months and it is possible that since that time the prescribing pattern might have been changed. Among different classes of drugs most commonly used, drugs among single therapy were angiotensin receptor antagonist (37.3%), Calcium channel blocker (32.8%) and ACE inhibitor (17.9%) subsequently. Noticeably use of Beta blocker was very low (6%). Use of combination therapy for the management of hypertension was significantly high (38.4%) and most favorable combination chosen by the physicians were calcium channel blocker with beta blocker and angiotensin receptor blocker with calcium channel antagonist and both patterns were prescribed at almost equal rate (28.1%) among Bangladeshi people. 25% patients were prescribed angiotensin receptor blocker along with diuretics combination rather than isolated use of diuretics and centrally acting drug like methyldopa and alpha blocker.

Our finding is slightly different from the observation of

Table 6. Comorbid disease along with hypertension.

	Name of the disease	%
Associated conditions	Diabetes mellitus	21.0
	High cholesterol	7.0
	Angina	18.0
	TIA or Stroke	12.0
	Poor vision	3.0
	Kidney disease	5.0
	None of the above	34.0

drug prescribed for hypertension at primary health care facilities in Trinidad in respect of using ACE inhibitor (67.1%), Beta blocker (26.6%) and calcium channel blocker (14.3%) (Clement et al., 2012). Another finding was observed in the department of veterans affairs, United States of America (USA) where there was increased use of ACE inhibitor (range 28.95 to 38.3%), Beta blocker (range 19.9 to 28.6%), thiazide diuretics (range 11.2 to 16.5%), calcium channel blockers (range 20.1 to 28.1%) and angiotensin receptor blockers (range 1.5 to 5.5%)(Lopez et al., 2000). As the national hypertension management guidelines was not available so different experience physicians can also impact the choose of drug during prescription which may influence the prescription pattern and may linked to the slight difference of pattern from other studies.

In this study, 61.6% patients were prescribed single drug and 38.4% patients were prescribed combined therapy. Whereas, the combination therapy is the most prescribed pattern than mono therapy in Nigeria but male patients were more than female patients which is similar to other studies (Etuk et al., 2008). In this study, combination therapy were prescribed by the physicians about 39% and among them calcium channel antagonist along with beta blocker combination and angiotensin receptor blocker with calcium antagonist were equally chosen by physician and it is 28.1% whereas angiotensin receptor blocker and diuretics combination were preferred 25%. Isolated use of diuretics in combination therapy is significantly low about 3%. Use of monotherapy was more in the study as probably because of improper use of referral system of this country. Most of the people use the tertiary care hospital as a primary treatment centre and single drug therapy was prescribed to manage initial hypertension usually. It was interesting to note that less frequent use of thiazide diuretics in this study which is similar to other study particularly in uncomplicated hypertension though different guidelines suggest the use of thiazide diuretics (Petitti et al., 2006).
The present study represents the prescription pattern of the antihypertensive drugs used in hypertensive patients with associated diabetes mellitus, angina and stroke or TIA which is similar to different studies (Etuk et al., 2008).

Conclusion

This study highlighted the current trend of utilization of antihypertensive medications in patients attending outdoor facilities in a tertiary care hospital in Bangladesh. The result indicated that the current prescribing pattern is not properly keeping correlation with JNC -8 (Joint national Committee) international guideline. A further evaluation of drug utilizations for hypertension is needed to determine the adequate control of blood pressure in hypertensive patients and an audit is therefore required to asses' the impact of drug therapy, utilization of maximum dose of the drugs and disease outcome following medications as well as strategies to improve patient adherence to drug treatment.

Limitations of the study

There were few limitations of this study because of its cross-sectional nature. The survey was conducted over a short period of time, and it is possible that since then the prescribing pattern might have been changed. There was no scope to assess the level of management of hypertension along with the control of co-morbid diseases like diabetes mellitus, chronic kidney disease etc. Severity of the disease may affect the required therapy. Detailed drug history of the patient could not be evaluated to determine whether any appropriate changes and/or adjustments to drug therapy were made to control the disease adequately. There was limitation in using the laboratory results, such as serum creatinine or urinary albumin, which could have given an insight into disease progression and control. Adherence of the treatment and follow up history were not taken because of limited resource and time constraints. Factors influencing the prescription writing by the physicians such as recent updated knowledge regarding institutional guidelines and others were not taken into account.

Abbreviations

AB, Alpha Blocker; **ACEI,** Angiotensin Converting Enzyme Inhibitor; **ARA,** Angiotensin Receptor Antagonist; **BB,** Beta Blocker; **CCB,** Calcium Channel Blocker; **DM,** Diabetes Mellitus; **DMCH,** Dhaka Medical College Hospital; **MPH,** Master of Public Health; **PCP,** Primary Care Physician; **OPD,** Out Patient Department; **TIA,** Transient Ischemic attack.

Conflict of Interests

The author has not declared any conflict of interests.

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