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Present Status of Antihypertensive Drugs associated with other Cardiovascular Diseases in Bangladesh


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ABSTRACT

Aims: To correlate treatment management of anti-hypertension and cardiovascular diseases. Methods: In this study a cross sectional observational was done on 200 patients among them 152 were male and 48 were female to find out the commonly used drugs for the treatment of hypertension and to determine the impact of different other risk factors on hypertension and associated cardiac diseases. Results: In this study a number of generics were found that included Beta blockers – Metoprolol (16%), Carvedilol (14%), Atenolol (6%); Calcium channel blocker – Amlodipine (17%); Diuretics – Furosemide + Spironolactone (16%); Angiotensin receptor blockers – Losartan (8%); ACE inhibitors – Ramipril (14%), Captopril (9%). An important observation is that Beta blockers are mostly used as antihypertensive. The prospect of Beta blocker is due to its compelling indication in post MI patients. Different other generics were also found that were used for the management of other cardiac problems. Among them antiplatelet agents like Aspirin + Clopidogrel (33%), Aspirin (6%) were predominant for the prevention of further heart attack, stroke and peripheral vascular disease. Lipid lowering agent like Atorvastatin (24%) was also found in a significant percentage. Other drugs were Vasodilator like Glyceril trinitrate (23%), Cardiac glycooides like Digoxin (4%), Anti-ischemic like Trimetazidine HCl (7%) and Anticoagulants like Warfarin (3%). During the study other factors like sex, occupation, age, blood pressure (systolic and diastolic), number of prescribed drugs, associated other disease, side effect profile and table salt consumption considered. Conclusions: In this study we worked on various types of cardiovascular drugs and its effect on hypertension. From the study we saw that the patients are given different types of drugs such as Beta blocker, Calcium channel blocker, Diuretics etc. for lowering hypertension. The ultimate goal of this study was to find out the current prescription pattern of physicians for the management of hypertension.

1. Introduction

Hypertension has been recognized for decades as a major predictor of adverse effect such as stroke, heart failure, end-stage renal disease, heart disease, and peripheral vascular disease. These estimates disease risk are the main components for the development and implementation of prevention, treatment, and control guidelines with a general theme of lower blood pressure levels associated with less adverse events [1]. Aerobic exercise and dietary modifications demonstrate to reduce blood pressure, randomized trials shows no effects of aerobic exercise combined with dietary modification on neurocognitive functioning in individuals with high blood pressure (i.e., pre-hypertension and stage 1 hypertension). Recent studies shows that, 124 participants with elevated blood pressure (systolic blood pressure 130 to 159 mm Hg or diastolic blood pressure 85 to 99 mm Hg) who were sedentary and overweight or obese (body mass index: 25 to 40 kg/m2) were randomized to the Dietary Approaches to Stop Hypertension (DASH) diet alone, a behavioral weight management program combined with exercise and caloric restriction or a usual diet control group. Participants completed neurocognitive tests including of executive function-memory-learning and
Psychomotor speed at baseline and again after the 4-month intervention. In combining aerobic exercise with the DASH diet and caloric restriction improves neurocognitive function among sedentary and overweight/obese individuals with pre-hypertension and hypertension [2]. The past 20 years data confirm that SBP and DBP shows continuous, graded, strong, independent, etiologically significant relationships to the outcome variables. These relationships are conducted in young, middle-aged, and older men and for middle-aged and older women of varying socioeconomic backgrounds and ethnicity. Among persons 35 years or more aged most have SBP/DBP above optimal (<120/<80 mm Hg). Hence, they are at increased CVD risk which is the blood pressure problem involves most of the population not only the substantial minority with clinical HBP. SBP relates even more strongly to risk than DBP for middle aged and older persons. Higher SBP results in greater CVD risk and curtailing of life expectancy by every DBP level [3]. Therapeutic lifestyle changes (TLC) are important for the prevention and management of hypertension. This result shows that TLC and their effects on blood pressure (BP) levels with emphasis on exercise and dietary habits. Regular moderate intensity (40%-70% of heart rate reserve) aerobic exercise training for 30 to 60 minutes 3 to 5 times per week can lower systolic and diastolic BP levels. In this case a greater reduction observed in patients with hypertension compared with those with normal BP levels. Natural products such as fruits, vegetables and whole grains with a moderate intake of low fat or fat-free dairy products and low in total and saturated fat, sodium, alcohol, such as the Dietary Approaches to Stop Hypertension eating pattern which significantly reduces BP levels. The TLC program including regular exercise and dietary modifications can also significantly reduce other risk factors for cardiovascular disease commonly accompanying hypertension. Several mechanisms appear to contribute to BP reduction by dietary intervention (reduced sodium, weight and alcohol and increased calcium, potassium, and magnesium). Exercise can improve in left ventricular structure and function, arterial endothelial function and compliance as well as perhaps vascular blood supply with increased cardio-respiratory endurance. The available evidence is robust in support of TLC for management of elevated BP and for the initial prevention of hypertension, recommendations are supported by the Joint National Committee Seventh Report on Detection, Evaluation, Prevention, and Treatment of High Blood Pressure [4]. Cardiovascular disease (CVD) is an abnormal function of the heart which can increase risks such as heart failure, heart attack, sudden death, stroke and cardiac rhythm problems thus resulting in decreased quality of life and decreased life expectancy. If oxygen doesn't arrive the tissue or organ will die. The cardiovascular disease causes structural defects such as infection, inflammation, environment and genetics. To prevent cardiovascular disease one must adopt a healthy lifestyle and avoid smoking, fattening foods and stress [5]. High blood pressure is a consistently elevated pressure of 140 mm Hg systolic or higher and/or 90 mm Hg diastolic or higher. The great danger is that we usually can't tell that someone is having high blood pressure. There are no signs and no one knows exactly causes of hypertension. High blood pressure can causes hardened arteries, heart failure, stroke or heart attack. Heart attacks occur when the blood flow to a part of the heart is blocked by a blood clot. Artery are died due to block of blood flow[6].

Materials & Method

3.1 Type of study

This was a cross sectional observational study that was attempted to find out the commonly used drugs for the treatment of hypertension and to determine the impact of different other risk factors on hypertension and associated cardiac diseases.

3.2 Place of study

The study was conducted in National Institute of Cardiovascular Diseases (NICVD) and Dhaka Medical College & Hospital (DMCH).

National Institute of Cardiovascular Diseases (NICVD) is the largest and the pioneer cardiac institute in Bangladesh. It was established in 1981, situated at Sher-E-Bangla Nagar of Dhaka city. The institute is composed of 400 beds, offering 24 hours of services. This institute comprises of outdoor, Emergency, highly specialized Coronary care unit, Post Coronary care unit, Intensive care unit and has a fully fledged indoor. A good number of Doctors and medical specialists and other supporting staffs are providing cardiac, medical and surgical care services to all categories of patients from different parts of the country including referred patients from other medical colleges and district hospitals.

Dhaka Medical College & Hospital (DMCH) is also another leading hospital in the country. It was established in 1946, situated at the heart of Dhaka in the academic zone along with University of Dhaka and Bangladesh University of Engineering and Technology. The hospital is composed of 400 beds, offering 24 hour services to the patients.

3.3 Study Population

All admitted patients of hypertension diagnosed by the hospital physicians.

- Patients of diagnosed hypertension ages 18-80 years.
- Both sexes irrespective of occupation and social class.
- Patients of cardiac disease other than hypertension
- Post operative patients
depending on different tasks of the study. Four months were spent on board meeting for literature review, selection of topic, development of the protocol. Subsequent months were spent on official correspondence, data collection, data analysis, report writing and submission of report.

3.12 Data analysis

All the data were checked after collection. Then data were entered into computer and results were calculated with the help of Microsoft Excel. The results were shown in column, cylinder, bar and pie chart.

Results

To find out the impact of risk factors of hypertension and the drugs that are commonly used for the treatment of hypertension, this study was performed in National Institute of Cardiovascular Disease (NICVD) and Dhaka Medical College Hospital (DMCH) & the data were collected from the admitted patients with hypertension. A total of 200 patients were included in the study. Among them 152 were male and 48 were female.

4.1 Distribution of Hypertension according to Sex

The distribution of Hypertension according to sex shows that 76% of male and 24% of female patients had Hypertension (Fig 4.1).

4.2 Distribution of Hypertension according to Occupation

The Major occupations of Hypertensive patients were 12.59% Farmers, 29.63% Businessmen, 29.63% Service holders, 5.93% Pension holders, 4.44% Unemployed, 3.70% Housewives and 11.85% other occupational patients (Fig 4.2).
4.3 Distribution of hypertension according to Age.

Age distribution of Hypertension patient shows, patients aged 56-65 years were more (34%) affected by hypertension but patients aged 46-55 years (26%) and 36-45 years (17%) also had high prevalence of Hypertension (Fig 4.3).

4.4 Distribution of Hypertension according to BP (Systolic in mm Hg)

Distribution of Hypertensive patients according to BP (Systolic) shows that, 38% patients had a Systolic pressure range from 121-140 mmHg, 25% patients had the range between 80-100 mmHg. While 18% have a systolic pressure of 141-160 mmHg, 15% having the range of 101-120 mmHg and 4% had the highest range of 161-180 mmHg. (Fig 4.4).

4.5 Distribution of Hypertension according to BP (Diastolic in mm Hg)

Distribution of Hypertensive patient according to BP (Diastolic) shows that, 24% patients had a diastolic pressure range from 81-90 mmHg, 21% patient had the range between 61-70 mmHg, While 19% had a diastolic pressure of 71-80 mmHg, 17% having the range of 50-60 mmHg, 13% having 91-100 mmHg and 6% had the highest range of 101-110 mmHg. (Fig 4.5).

4.6 Distribution of Hypertension according to no. of prescribed drugs to the Patient by the doctor

Fig 4.6 shows that 43% of interviewed patients were prescribed 5-7 drugs, 36% were prescribed 8-10 drugs, 15% of the patients were prescribed more than 10 drugs and 6% were prescribed 2-4 drugs.

4.7 Distribution of Hypertensive Patients with other Diseases

Fig 4.7 shows that among all the patients, 167 patients suffered from Gastritis, 124 patients suffered from Asthma or breathing problem, 96 patient had Diabetes and 37 patient had other diseases.
4.8 Distribution of hypertension according to Side Effect Profile of patient

Fig 4.8 shows the side effects profile of the patient. Of them 33 had chest pain/pain, 24 had weakness, 14 had headache, 5 had vomiting, 3 had nausea and 22 patient had others side effects.

4.9 Consumption of Table salt by Hypertensive patient

Fig 4.9 shows that 72% patients consumed table salt and 28% of them did not consume salt.

4.10 Antihypertensive Generics found in survey

Fig 4.10 shows the percentage of antihypertensive drugs found in the study. Out of all antihypertensive generics, Amlodipine was 17%, Metoprolol was 16%, Furosemide + Spironolactone was 16%, Carvedilol was 14%, Ramipril was 14%, Captopril was 9%, Losartan was 8% and Amlodipine + Atenolol was 6%.

4.11 Other Cardiac Generics found in survey

Fig 4.11 shows the percentage of other cardiac generics found in the study. Out of all other cardiac generics, Clopidogrel + Aspirin was 33%, Atorvastatin was 24%, Glyceryl trinitrate was 23%, Trimetazidine HCl was 7%, Aspirin was 6%, Digoxin was 4% and Warfarin was 3%.

4.12 Comparison of Antihypertensive and Other Drugs

Fig 4.12 shows that of all the total drug types found in the survey, 30% drugs were of antihypertensive class while 70% were of other different classes.

4.13 Distribution of no. of patient according to cured percentage

Fig 4.13 shows that percentages of no. of patient partially cured were 66%, while 26% were maximum cured and 7.5% were not well or decreased condition.
Discussion

To find out the impact of risk factors of hypertension and the drugs that are commonly used for the treatment of hypertension, this study was performed in NICVD and DMCH and the data were collected from the admitted patients with hypertension irrespective of sex and occupation. Patient’s personal and medical history like blood pressure and diagnosis profile were also collected. All the patients were prescribed different medications. They were interviewed by asking question in Bengali, using a thoroughly preplanned questionnaire.

The most important observation of the study is that the age group of 36-65 years had the highest incidence of hypertension. 6% patients belonged to age group of less than 36 years and 17% patients belonged to age group of more than 66 years suffered from hypertension. Considering Bangladesh perspective, middle aged group mostly suffered from hypertension. But elderly people are also affected in a significant percentage. Another important finding is that male patients (76%) are affected by hypertension to a greater extent compared to female patient (24%).

Another important issue is that about 12.59% were farmers, 29.63% were businessmen, 29.63% were service holder, 5.93% were pension holder, 4.44% were unemployed, 3.70% were housewives, and 11.85% were from other different categories. This is to notice that businessmen and service holders suffered more from hypertension than other professionals. Increased mental stress and lack of physical activity are likely to be the contributing factors here and hence, urban people are more likely to develop hypertension than rural people.

Total number of prescribed drugs for the treatment of hypertension with other associated problems was variable. 6% of the patients were prescribed 2-4 drugs, 43% were prescribed 5-7 drugs, 35.50% were prescribed 8-10 drugs and 14.50% were prescribed more than 10 drugs. Among them 30.25% drugs were for hypertension and 69.75% were for other diseases. Nearly all the hypertensive patients suffered from other associated problems. Among them Gastritis was the most prevalent. 167 patients suffered from Gastritis, 96 suffered from Diabetes, 124 suffered from Asthma or Breathing problem and 37 suffered from other problems.

The most important feature of the study was to find out commonly prescribed drugs by physicians for the treatment of hypertension. A number of generics were found in the study that included Beta blockers – Metoprolol (16%), Carvedilol (14%), Atenolol (6%); Calcium channel blocker – Amlodipine (17%); Diuretics – Furosemide + Spironolactone (16%); Angiotensin receptor blockers – Losartan (8%); ACE inhibitors – Ramipril (14%), Captopril (9%). An important observation is that Beta blockers are mostly used as antihypertensive. The prospect of Beta blocker is due to its compelling indication in post MI patients.

Different other generics were also found that were used for the management of other cardiac problems. Among them antiplatelet agents like Aspirin + Clopidogrel (33%), Aspirin (6%) were predominant for the prevention of further heart attack, stroke and peripheral vascular disease. Lipid lowering agent like Atorvastatin (24%) was also found in a significant percentage. Other drugs were Vasodilator like Glyceril trinitrate (23%), Cardiac glycosides like Digoxin (4%), Anti-ischemic like Trimetazidine HCl (7%) and Anticoagulants like Warfarin (3%).

Considering side effect profile of the admitted hypertensive patient, Chest pain and Weakness were found to be mostly prevalent. 24 patients experienced weakness, 14 patients had headache, 5 patients had vomiting, 3 patients had nausea, 33 patients had chest pain and 22 patients had different other side effects.

Conclusion

In modern times, cardiac disease has emerged as the leading cause of death worldwide, particularly in developed countries. The World Health Organization reported that 16.7 million deaths in 2003 (29.2% of total global deaths) were caused by some form of cardiovascular disease. Though the rate of cardiac disease is highest in developed countries, developing countries are seeing an increase in the occurrence of cardiac disease, as well as a corresponding rise in the number of heart-related deaths. The World Health Organization estimates that by 2010, cardiac disease will surpass AIDS as the leading cause of death in developing countries.

High blood pressure is the most common chronic medical problem prompting visits to primary health care providers. The medical, economic, and human costs of untreated and inadequately controlled high blood pressure are enormous. Adequate management of hypertension can be hampered by inadequacies in the diagnosis, treatment, and/or control of high blood pressure. Health care providers face many obstacles to achieving blood pressure control from their patients, including resistance to taking multiple medications to reach blood pressure goals. Patients also face the challenges of adhering to medicine schedules and making lifestyle changes. Nonetheless, the achievement of blood pressure goals is possible, and most importantly, lowering blood pressure significantly reduces the risk of death due to heart disease, the development of other debilitating conditions, and the cost associated with advanced medical care.

The World Health Organization attributes hypertension, or high blood pressure, as the leading cause of cardiovascular mortality. In this study we worked on various types of cardiovascular drugs and its effect on hypertension. From the study we saw that the patients were given different types of drugs such as Beta blocker, Calcium channel blocker, Diuretics etc. for lowering hypertension. The ultimate goal of this study was to find out the current prescription pattern of physicians for the management of hypertension.
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