PATTERN OF ANTIHYPERTENSIVE DRUGS USED FOR HOSPITALISED ADULT PATIENTS

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Summary

Hypertension is a leading contributor to global burden of cardiovascular as well as cerebrovascular mortality and morbidity. This paper presents a study on prescription patterns of antihypertensive drugs at medicine ward of a private hospital. An observational study was done for 6 months period (1st March 2015 to 30th August 2015) on 82 Patients at Medicine ward of Southern Medical College Hospital. The objectives of this study were to identify whether monotherapy or combination therapy was most effective in controlling blood pressure, to identify types of antihypertensive drugs most commonly prescribed, to find out most preferred combinations and to see if prescription pattern complied with existing guidelines.Patients of 18 years old or above diagnosed as hypertensive according to JNC-7 and those being prescribed with antihypertensives as well as given consent for the study were included. Among 82 hypertensive patients, male constituted 53.7% and female 46.3%. Monotherapy was prescribed for 42.7% and combination therapy for 57.3% patients. 42.7% received two drugs, 13.4% received three drugs and 1.2% received four drug combinations. Of all monotherapy users, Angiotensin Receptor Blocker (ARB) was most prescibed, used in 77.2% cases. Regarding combination therapy, most preferred combination was ARB and calcium-channel-blocker, used in 44.6% cases. Olmesartan (79.4%) was most preferred as ARB. Combination therapy was more preferred than monotherapy and two drug combination was mostly selected. Angiotensin Receptor Blocker was mostly used agent. Existing guidelines had implications in prescribing pattern of antihypertensive drugs.

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Key words

Antihypertensives; Monotherapy; Combination therapy; Prescription pattern.

Introduction

Hypertension is a leading contributor to global burden of cardiovascular as well as cerebrovascular mortality and morbidity [1]. Apart from unhealthy life-style and lack of awareness, socio-economic factor as well as poor compliance to medication may contribute to uncontrolled hypertension. In addition, elderly patients often have multiple pathologies, leading to polypharmacy with altered pharmacokinetics and pharmacodynamics, resultant effect of prone to adverse drug reaction [2]. Now-a-days recently published hypertension guidelines and recommendations greatly influence prescription pattern of physicians. However, all the guidelines emphasis the individualized selection of medicine for each patient according to best judgement of physician.

This presents a study on prescription patterns of antihypertensive drugs at medicine ward of a tertiary level hospital.

Materials and methods

Objectives

i) To find out the commonly prescribed antihypertensive drugs.
ii) To look for commonly prescribed antihypertensive drug combinations.
iii) To measure the effects of mono-therapy over combination therapy for controlling blood pressure.
iv) To see the compliance of present 'Hypertension Guideline' for treating hypertension.

Study design & population

This prospective observational study was done on 82 patient admitted in the Department of Medicine Southern Medical College Hospital a non government Medical College Hospital in Chittagong for a period of 6 months from March to August 2015. A written informed consent was obtained from all the patients. The study was approved by local ethical committee.

Inclusion criteria

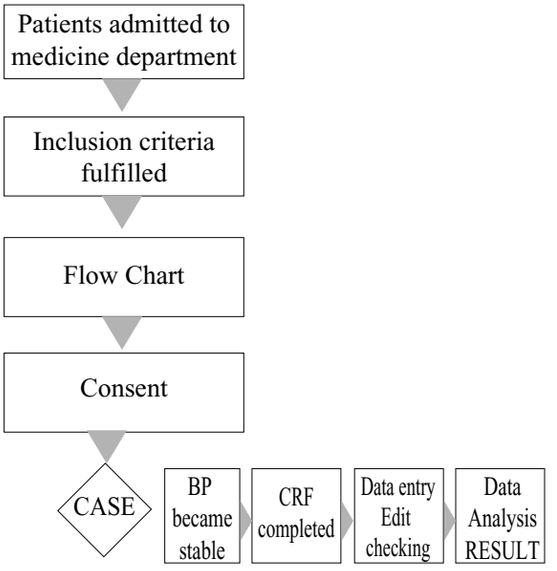
i) Those receiving or being prescribed with antihypertensive drugs.
ii) Patients aged >18 years diagnosed as hypertensive according to JNC-7 [3].
iii) Those fulfilling any or both of above criteria gave consent to participate in the study.

Exclusion Criteria

i) Patients of <18 years old
ii) Patients having hypertension controlled with diet and life-style modification alone
iii) Those who did not give consent to participate in study.

Procedure

All the patient admitted in the Department of Medicine aged >18 years were screened to identify the hypertensive patients on two consecutive record by on duty doctors. Those who fulfilled the inclusion criteria was initially selected for the study. Then the study objectives and details procedure was described to the patient, a written informed consent was taken from the patient willing to participate in the study. Detailed history, complete physical examination and baseline investigations were done in all patients, co-morbidities were looked for. The case record form was completed once the blood pressure became stable. The data entry and edit checking was performed, after which data was handed over to statistician for analysis. SPSS (Statistical Package for Social Sciences) was used for analysis of result.



Results

Among 82 hypertensive patients, male constituted 53.7% and female 46.3% with male to female ratio of 1.2: 1. Age distribution of patients showed that 36.6% patients were in the age group of 51 to 60 years, followed by 28% from the age group of 61 to 70 years, 17% in the group of 41 to 50 years, 9.8% for 71 to 80 years and 8.6% for 31 to 40 years (Fig 1). There was no pregnant patient among them, although pregnancy was not an exclusion criteria. Monotherapy was preferred for 42.7% and combination therapy for 57.3% patients. Among all, 42.7% received two drugs, 13.4% received three drugs and 1.2% received four drug combinations (Fig 2). Out of all monotherapy users, Angiotensin Receptor Blocker (ARB) was the most preferred, used in 77.2% cases, followed by calcium channel blocker (17%) and beta blocker (5.8%). Among ARBs, Olmesartan was used in 79.4%, followed by losartan (20.6%) (Fig 3). Regarding two-drug combination therapy, most preferred combination was ARB and calcium-channel-blocker, used in 48.6% cases (Fig 4). Calcium channel blocker was most preferred as a component of combination therapy. In three-drug combination group, most common components were ARB, Calcium channel blocker and diuretics (Fig 5).

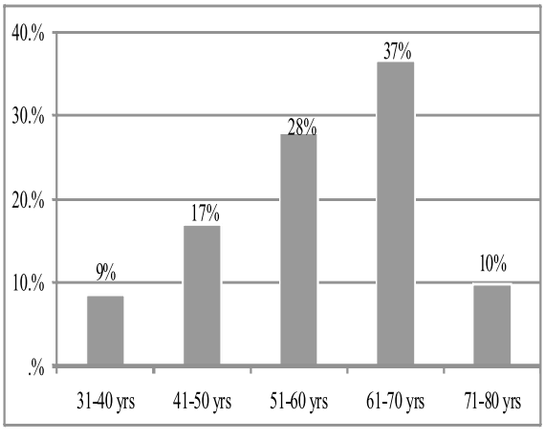


Figure 1 : Age distribution of hypertensive patients admitted to Medicine Department Southern Medical College Hospital (SMCH)

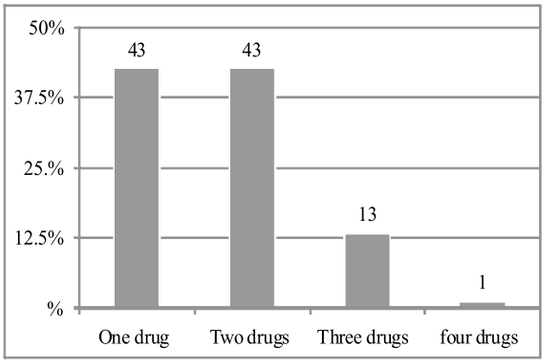


Figure 2 : Number of antihypertensive drugs prescribed at Medicine Department Southern Medical College Hospital (SMCH)

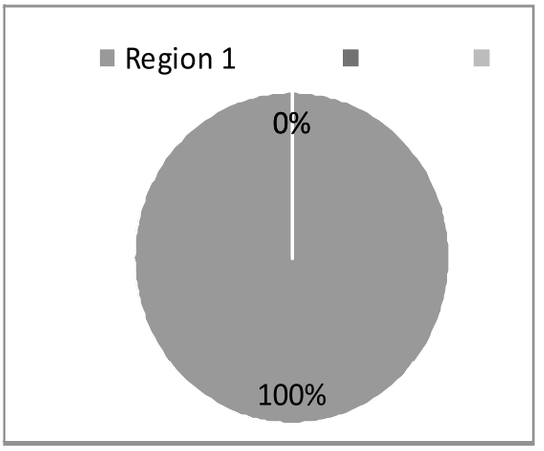


Figure 3: Monotherapy for in-hospital hypertensive patients at Medicine department Southern Medical College Hospital (SMCH)

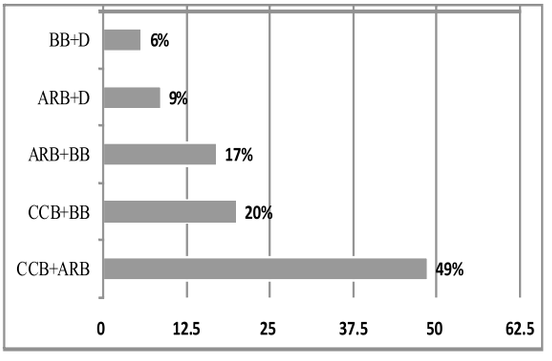


Figure 4 : Two-drug combination therapy for in-hospital hypertensive patients

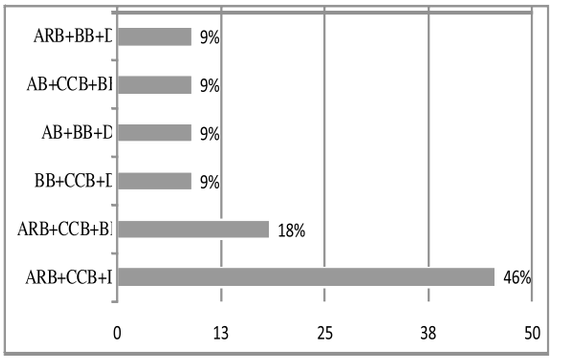


Figure 5 : Three-drug combination therapy for in-hospital hypertensive patients

Discussion

Among 82 participants, male to female ratio was 1.2:1, which was very close to observations in previously done studies at USA and Canada for gender distribution in hypertensive population [4-6]. Practically, males have greater tendency to develop hypertension than premenopausal females. However, the incidence rises postmenopausal females due lack of cardio-protective effects of female hormones [7,8].

Age distribution reflected that maximum hypertensive patients belonged to the age group of 51 to 60 years, the most vulnerable age group for essential hypertension, followed by 61 to 70 years, 71 to 80 years and 31 to 40 years. In observations made by Sung Sug Yoon, Vicki Burt,Tatiana Louis, and Margaret D. Carroll in the national center for health statistics, the prevalence of hypertension among US population was 6.8% for those aged 18–39, 30.4% for those aged 40–59, and 66.7% for those aged 60 and over in 2009-2010 [9].

In the present study, combination therapy (57.3%) was more preferred than monotherapy (42.7%) for control of hypertension. Evidences showed that combination therapy became necessary in the majority of hypertensive patients to achieve the target blood pressure [10]. It is shown that combination therapy offers a better antihypertensive efficacy and higher response rates with low range of doses, better tolerance, improved compliance, simple drug regimen and lower cost. The average number of drugs required to reach blood pressure goals was 3.2, in trials focusing on cardiovascular morbidity and mortality. It is expected that the combination should increase the desired therapeutic effect but not the side effects.

However, the combination must be compatible pharmacokinetically, block counter-regulatory system activation, have additive effects on BP reduction, and increase tolerability [11-12].

ARB/ ACEI was mostly used (77.2%) agent as monotherapy and Olmesartan got the priority (79.4% of all ARB). This observation might be reflection of the fact that olmesartan has a prolonged half-life with high receptor-binding capacity, making them more preferable to select [13 -17]. As monotherapy, calcium channel blocker had the second preference (17%) beta blockers and diuretics came down to the bottom of list. Beta blocker, which was one of the first-choice antihypertensives in the 19th century, got least priority in isolated hypertension, and strongly discouraged in stroke patients, as recommended in the report of JNC 8 [17-19].

Among combination therapy, Two drug combination was mostly selected (42.7%) and most preferred combination was ARB plus calcium-channel blocker (44.6%). The preference of this combination was also observed in studies done by Menco G. Niemeijer and Ton J. Cleophas [20].

Limitations & Recommendation

- This a single centre statistics, cumulative analysis of data from multiple centres may represent the nation-wide picture.
- Cost implications of prescription pattern needs to be considered during selection of antihypertensives.

Conclusion

Increasing awareness about hypertension among public as well as physicians, along with recently published guidelines have greatly influenced the prescription pattern of antihypertensive medication. The key findings were increasing preference of combination drugs, superiority in selection of ARB as monotherapy and low preference of beta blocker. This a single centre statistics, cumulative analysis of data from multiple centres may represent the nation-wide picture and allow more comprehensive analysis of data.

Disclosure

All the authors declared no competing interest.

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