

Pilot Study, Antihypertensive Prescription Analysis of Hypertensive Patients at Community Pharmacy Outlet; Sri Lankan Perspectives

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Abstract — Prescribing pattern of antihypertensive medicines is much concerned in the context of treating this disease hypertension. The main objective was to determine prescribing patterns of antihypertensive medicines. Hundred prescriptions were collected from one community pharmacy outlet for three days. Prescriptions of hypertensive patients were analysed by using Microsoft Excel. Out of hundred prescriptions, 57% accounted for female and 43% for male. According to the results, antihypertensive drugs were widely prescribed for patients (54%) above 60 years, as expected following 45% of patients within 20-60 years age category. But, only one patient below 20 years of age (1%) was prescribed with anti-hypertensives. Out of all the prescribed anti-hypertensives, 59% accounted for Angiotensin Receptor Blockers (ARBs) & Angiotensin Converting Enzyme Inhibitors (ACEIs) followed by Calcium Channel Blockers (CCB) (16%), Diuretics (13%), β -Blockers (5%) and others (Alpha blockers, Potassium channel blockers, α & β blockers & Alpha-2 adrenergic receptor agonists) (7%) respectively. Losartan was the highly prescribed ACEI and ARBs (85%) followed by HCT (Diuretic) (75%) Diltiazem and Nifedipine (CCB) (36% equally) and Bisoprolol (β -Blocker) (57%) as highly prescribed anti-hypertensives under each category. Study concluded that, ACEIs and ARBs were the highly prescribed drug category following the drug Losartan. 1% from the total prescriptions were accounted for prescribing Nifedipine (CCB) only for the age below 20. But there were antihypertensive drug combinations prescribed for the 20-60 and above 60 age categories rather than prescribing a single antihypertensive. Further recommended to analyse the types of anti-hypertensive combinations among each age category.

Keywords— Community Pharmacy; Hypertension; Anti-hypertensives

I. INTRODUCTION

Blood pressure is the force exerted by circulating blood against the walls of the body's arteries and the major blood vessels in the body. Hypertension, also known as high or elevated blood pressure, is a condition in which the blood vessels have persistently raised pressure (WHO, Hypertension, 2019). According to the estimation of World Health Organization (WHO), 1.13 billion people worldwide have hypertension and most of them are living in low and middle-income countries. Since hypertension is a major cause of premature death throughout the world (WHO, Hypertension, 2019), it is a serious medical condition that significantly increases the risk of occurring heart, brain, kidney and other diseases. This is becoming one of the most

dangerous non - infectious diseases in Sri Lanka as well (WHO, Hypertension, 2019). Considering risk factors there are modifiable risk factors that include unhealthy diets (excessive salt consumption, a diet high in saturated fat and trans fats, low intake of fruits and vegetables), physical inactivity, consumption of tobacco and alcohol, as well as being overweight or obese. Non-modifiable risk factors include a family history of hypertension, age, gender and co-existing diseases such as diabetes or kidney disease. (WHO, Hypertension, 2019).

According to the research carried out on prescribing patterns of antihypertensive drugs taken by geriatric patients in an out-patient department at Rohini Super Speciality Hospital, India. Out of 100 prescriptions, 72% of the patients were in the age group of 65-67 years, followed by 26% in 68-70 years and 2% who were >70 years This was found out to be higher in men 69% than in women, which was 31% (Mateti *et al.*, 2012). In addition, the most commonly prescribed drug classes involved were Calcium Channel Blockers (CCBs) 37% followed by Angiotensin II receptor antagonists 21% and Anti-hypertensive drug combinations among hypertensive patients were seen among this community and this practice positively impacted on the overall control of the blood pressure. It was Amlodipine (38%), the most commonly prescribed monotherapy, and the most common two drug combination therapy was Amlodipine + Atenolol 7%. (Mateti *et al.*, 2012). The research study "Who is using antihypertensive drugs? A prescription analysis from Finland" carried out by Wallenius *et al.*, in 1996 has suggested that the choice of antihypertensive drugs depends on the age and gender of a patient. According to the study results, 23% of the men received a drug belonging to the hypotensive group and nearly half 50% were prescribed with a beta blocking agent, and 27% with a diuretic (Wallenius *et al.*, 1996). Among women the distribution of the different drug groups was more even: more than half the women (55%) were prescribed with antihypertensives while beta blocking agents and diuretics were prescribed for 43% and 44 %, respectively (Wallenius *et al.*, 1996). According to the research which was conducted in a teaching hospital Lagos, Nigeria 2016 on 200 patients, 5 (2.5%) were on monotherapy and 195 (97.5%) were on combination therapy. The various classes of antihypertensive drugs prescribed were Diuretics 128 (64.0%), Beta-blockers 126 (63.0%), Calcium channel blockers 106 (53.0%), Angiotensin-converting enzymes inhibitors 103 (51.5%), Angiotensin receptor blockers 33 (16.5%), Alpha blockers 9

(4.5%), and fixed drug combinations 2 (1.0%) (Bakare *et al.*, 2016).

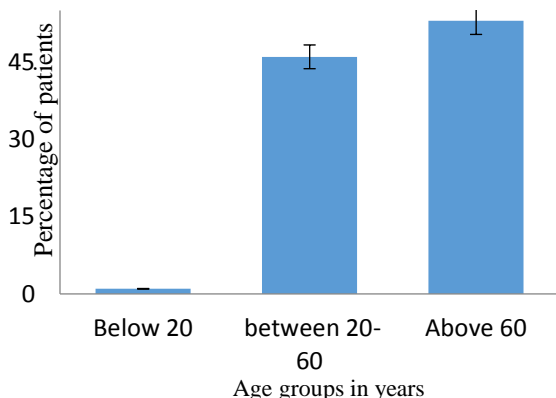
Prescribing pattern of antihypertensive drugs is much alarmed in the context of treating hypertension. The main objective was to determine prescribing patterns of antihypertensive drugs in a selected population as a pilot study. Besides, the study will access the determination of most commonly prescribed antihypertensive among drug categories and the correlation between ages, gender, with hypertension. The explorations will be assistive for the further studies which correlated with hypertension.

II. MATERIALS AND METHODS

Hundred prescriptions were collected from a community pharmacy at Mahagama on 17th, 18th and 19th of February 2020, from 9am to 5pm. All the records were analysed by using Microsoft Excel according to the age group and gender of the patients. Age group categorization was done according to three age groups as; first group within the ages below 20 years, second group between the ages of 20-60, third group within ages above 60. The most frequently prescribed medication for hypertension were identified and all the results were analysed in a graphical way with further descriptive information.

III. RESULTS

Our results show that out of hundred prescriptions of hypertensive patients 57% were female and 43% were male. Prescription data was analysed as per the age categories and data were categorized into three age groups. They were age below 20, ages between 20-60 and ages above 60. According to the results, antihypertensive drugs written prescriptions



were highly prescribed for patients (54%) above 60 years, as expected following 45% of patients within 20-60 years age category. one patient (1%) was prescribed with anti-hypertensives below age 20. The mentioned data are depicted in the figure 1.

Figure 1 shows the age-based classification of the antihypertensive prescriptions used in our study. Data shows that most of the prescriptions belongs to above 60 age group and lowest found with the below 20 age group

We further analysed our data to find out the qualitative and quantitative difference of drug groups in the given prescriptions in this study. Mostly prescribed drug group was identified as ACE inhibitors and receptor blockers (59%) and

16% of the analysed antihypertensive prescriptions were identified from calcium channel blocker group. Diuretic prescriptions were 13%. β -Blockers were the least prescribed drug category in our study and it is 5%. Other drugs like alpha blockers and potassium channel blockers is 7%. Details are given in figure 2

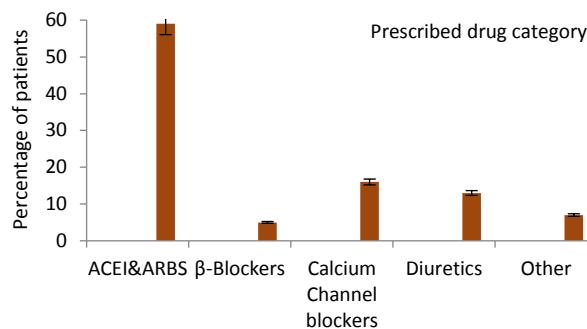


Figure 2 shows qualitative and quantitative prescription analysis of our study group. Prescription collected from the study place were further analysed for qualitative and quantitative calculations. This study shows that most prescribed antihypertensive drug category was ACE inhibitors and ACE receptor blockers and beta blockers; calcium channel blockers and diuretics are the next common drugs groups identified.

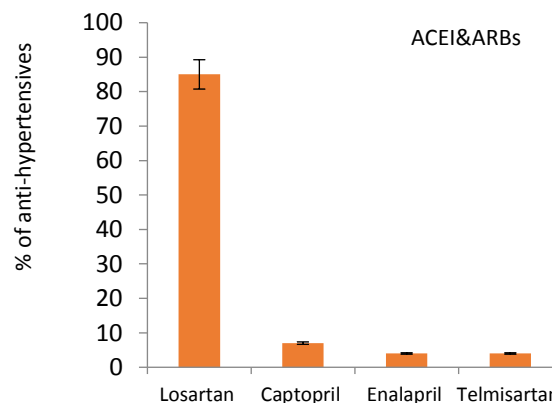
Prescriptions with Monotherapy or multiple therapy

Our research also identified that majority of antihypertensive prescriptions are (67%) monotherapy and only 33% were on combination therapy. Combination patterns of the antihypertensive drugs were further analysed and found that losartan + HCT and losartan + amlodipine (18%, equally) were the commonly used combination therapies. Most common three drug combination therapy was HCT+ losartan+ carvedilol (25%). This research has shown that combined antihypertensive drugs are more commoner than monotherapy for the patients between 20-60 years and above 60 years (figure 3)

Considering the most commonly used antihypertensive drugs among mentioned categories, Losartan was the highly prescribed ACEI and ARBs 85% (fig. 3a) followed by HCT 75% (diuretics, fig. 3b), diltiazem and nifedipine which are 36% (CCBs, fig. 3c) and bisoprolol 57% (β -blockers, fig. 3d)

Detailed analysis of the antihypertensive therapy

3a



3b

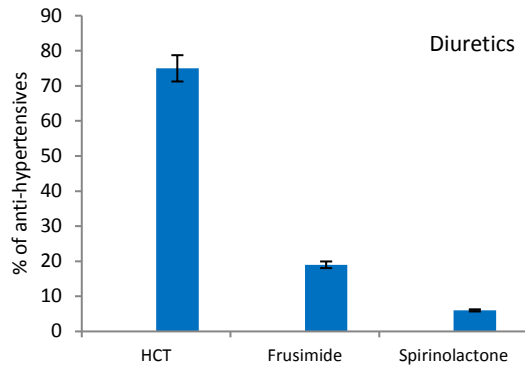
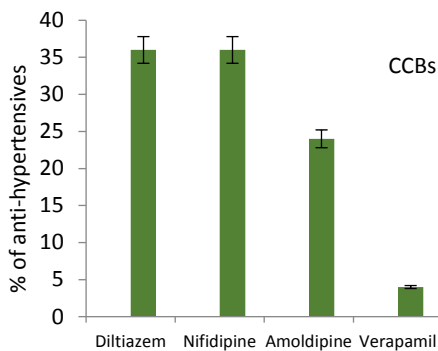


Figure 3a, 3b, 3c and 3d shows that qualitative prescription analysis of ACEI/ARBs blocker (3a), diuretic analysis (3b) CCB analysis (3c) and beta blocker analysis (3d) therapy in the prescription for hypertension in our study group. Data shows that most common drug are losartan, HCT Diltiazem and Bisoprolol in ACEI/ ARBS, Diuretics, CCB, and beta blockers respectively.

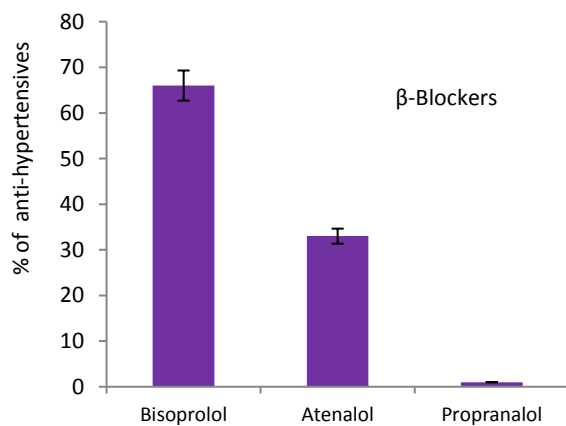
IV DISCUSSION

Hypertension is frequently seen among people of Sri Lanka. One of our objectives was to find out the different types of prescribing patterns of antihypertensive drugs. Hundred prescriptions were collected from a community pharmacy at Mahagama and all the information of prescriptions were analyzed according to the age groups, gender and prescribed antihypertensive drugs. Age groups were categorized as; below 20 years, between 20- 60 years and above 60 years. According to the prescribed antihypertensive drugs there were variety of categories of antihypertensive drugs. ACEIs and ARBs (ACEI prevents an enzyme from producing angiotensin II which is a potent vasoconstrictor whereas ARBs block the effect of angiotensin II on its receptor), β -Blockers (Beta Adrenergic Receptor Blocking Agents), CCBs (Reduce influx of calcium ions into cardiac cells), Diuretics (increased production of urine) and other drugs (Alpha blockers, Potassium Channel Blockers, α and β Blockers) were the different categories of drugs. In the present study, hypertensive patients were classified based on their gender. More than one half of the study population was female (57%). Our study showed totally opposite findings of Mateti *et al.*, indicating that hypertension was more common in men than women. It was found to be high as 54% in the age group above 60 years and low as 1% in the age group below 20. In contrast, similar results were obtained by the same group, Mateti *et al.*, and found that 72% of geriatric patient were prescribed with antihypertensive drugs. According to the British hypertensive society guidelines, there are four main different categories of antihypertensive drugs. ARBs & ACEIs, β -Blockers, CCBs and Diuretics. We also found that, ARBs & ACEIs (59%) were identified as the most frequently prescribed antihypertensive drug category followed by CCBs (16%), Diuretics (13%), and β -Blockers (5%). The obtained results were different from studies of Bakare *et al.*, and Wallenius *et al.*, Wallenius *et al.*, had obtained β -Blockers as the most frequently prescribed antihypertensive drug category (>50%).

3c



3d



Our finding on 67% were on monotherapy and 33% were on combination therapy were compared with the study of Bakare *et al.*, in which out of 200 patients, and identified different results (2.5% were on monotherapy and 97.5% were on combination therapy). Present study has shown Losartan (75%) as the most commonly prescribed antihypertensive medicine. But it was Amlodipine (38%) in the study of Mateti *et al.* In this study, Losartan+HCT and Losartan+Amlodipine (18%) were the commonly used two drug combination therapy while most common two drug combination therapy and the study of Mateti *et al* was Amlodipine + Atenolol 7%. This research was based on 100 prescriptions at community pharmacy settings, under the categories of gender, age groups and anti-hypertensive drug categories. This was done to get a

better understanding of the risk factors and risky groups. This study was useful to observe the trends in the treatment, to get an idea on the gender and age category which tends more to suffer from hypertension and to be familiarized with antihypertensive drugs which are more commonly prescribed among patients with hypertension in the selected community. This study can be further developed to study the reasons for the occurrence of hypertension and preventive measures.

IV. CONCLUSION

Considering the drug categories, Angiotensin Converting Enzyme Inhibitors (ACEIs) and Angiotensin Receptor Blockers (ARBs) are highly prescribed for hypertension and

Losartan is the highly prescribed drug among the drugs belonging to this category. The research has shown that combined antihypertensives are more common than monotherapy for the patients between 20-60 years and above 60 years.

V. RECOMMENDATION

This study can be further developed to analyse the different types of antihypertensive combinations among each age groups.

VI. ACKNOWLEDGMENT

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