SPC ANTI-HYPERTENSIVE MEDICATIONS

Use of single pill anti-hypertensive combination medications in Cardiology Clinic of a Tertiary Health Institution in Nigeria

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ABSTRACT

Background: Majority of patients with hypertension require 2 or more medications to provide adequate blood pressure (BP) control. In addition, contemporary guidelines on the management of hypertension favor the use of single-pill combinations (SPCs) as they simplify the treatment regimen and decrease the daily pill burden for patients, both of which are associated with improved adherence. In spite of this, there is a lack of data in sub-Saharan Africa on the frequency of use of SPC anti-hypertensive medications.

Method: We prospectively collected detailed clinical data from 373 patients with primary diagnosis of hypertension attending the cardiology clinic of University of Abuja Teaching Hospital between 2016 and 2017.

Results: Three hundred and seventy three patients with mean age of 50.6 ± 12.3 years and mean body mass index of 31.2 ± 6.5kg/m² on anti-hypertensive treatment were evaluated. Baseline mean systolic and diastolic BPs were 161.1 ± 3.1mmHg and 95.4 ± 15.6mmHg respectively, while the mean pulse pressure was 56.6 ± 18.1mmHg. 212 (56.8%) where on SPCs, with 32.5% on angiotensin receptor blockers (ARBs) plus hydrochlorothiazide (HCTZ), 18.9% on angiotensin converting enzyme inhibitors (ACEIs) plus HCTZ, 9.9% on amlodipine (AML) plus ARB, 3.3% on AML plus ACEI, 3.8% on thiazide-like diuretic plus atenolol, 29.2% on HCTZ plus amiloride, and 2.4% on triple combination of AML+ARB+HCTZ.

Conclusion: Our study has shown that over 50% of our patients were on SPC anti-hypertensive medications, with the most prescribed single pill combination being angiotensin receptor blocker plus thiazide diuretic.

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INTRODUCTION

It has been shown that as low as 2mmHg reduction in systolic blood pressure (BP) is associated with a 7% reduction in the risk of ischaemic heart disease and a 10% reduction in the risk of stroke.[1] In addition, numerous large clinical trials have demonstrated that most patients require more than one anti-hypertensive agent to achieve target BP.[2-4] Therefore, current guidelines,[5-11] recommend the use of combination therapy as first-line treatment or early in the management of hypertensive patients. Furthermore, with the benefits of single pill anti-hypertension combination therapy, contemporary guidelines on the management of hypertension now favour their use.[5-9]

Whereas the benefits of combination therapy including single pill combinations are obvious, and the best combination for the black African hypertensive patient has been described,[12] there is a lack of data on the frequency of the use of single pill anti-hypertensive combination therapies in health facilities. We therefore aim to study the frequency, and pattern of use of single pill anti-hypertensive combination therapies in a tertiary healthcare facility in Nigeria.

METHODS

Patients

Three hundred and seventy three (373) hypertensive participants aged 18-years and above and presenting de novo to the Cardiology Unit of University of Abuja Teaching Hospital during a 1-year period (2016 - 2017) were studied. Patients were referred from both primary and secondary health centres

in neighbouring towns and states. Reasons for referral ranged from poor blood pressure control to suspected target organ damage, especially left atrial enlargement and left ventricular hypertrophy, as detected by electrocardiography. Patients were captured as part of the Abuja Heart Registry which was a prospective registry of all patients presenting to the Cardiology Unit of University of Abuja Teaching Hospital from April 2006 - April 2017.[11]

Measurements

Baseline clinical and demographic characteristics were obtained from the patients using case report forms. Information obtained were age, sex and type of anti-hypertensive medications. Patients' height was measured with patients wearing no shoes or headgear. Body mass index was calculated using the formula weight/height^2. Blood pressure measurements were obtained according to standard guidelines with a mercury sphygmomanometer (Accouson, London). Systolic and diastolic BPs were measured at Korotkoff sounds I and V, respectively. BP was measured from the right arm 3 times after a 5-minute rest with the patient in a sitting position, and the average of the 3 measurements was obtained. Each patient had fasting blood sugar, fasting lipid profile, electrolyte, urea and creatinine, and full blood cell count assessed after an 8- to 12-hour fast. All patients gave written informed consent before they were enrolled into the study. Ethical clearance was obtained from University of Abuja Teaching Hospital Ethical Clearance Committee.

STATISTICAL ANALYSIS

SPSS software version 20.0 (SPSS Inc., Chicago, IL) was used for statistical analysis. Continuous variables were expressed as mean ± SD and categorical variables expressed as percentages. Comparison of baseline characteristics in male and female patients was performed by Student's t-test. A 2-tailed p-value <0.05 was considered to be significant.

RESULTS

Table I shows the clinical and demographic characteristics of the study population with 47.5% being female. The patients were on average middle-aged (51.6 ± 11.6 years), and there was no age difference between the male and female population. There was also no difference in blood pressure and metabolic profiles between the male and female patients. The female patients however had significantly higher body mass index compared to the male patients (31.9 ± 7.4kg/m^2 versus 28.1 ± 5.3kg/m^2, p<0.001).

Figure I shows the pattern of prescription of SPC anti-hypertensive medications. 56.8% of the 373 patients studied were on SPCs. The most prescribed SPC is ARB plus HCTZ in 32.5% of cases, while HCTZ plus amiloride was the second most prescribed combination in 29.2% of cases. The least prescribed 2-drug SPC anti-hypertensive medication is AML plus ARB in 3.3% of cases, while the least prescribed is the triple pill combination of AML plus ARB plus HCTZ in 2.4% of cases.

TABLE I: Baseline characteristics of the study population.

Variable	All Patients (n = 373)	Male patients	High ≥11mmol/l n = 998 (35%)	p-value
Age, years	51.6 ± 11.6	51.9 ± 11.4	51.1 ± 11.9	0.49
BMI, kg/m^2	29.9 ± 6.7	28.1 ± 5.3	31.9 ± 7.4	<0.001
SBP, mmHg	155.1 ± 24.7	154.8 ± 24.9	155.7 ± 24.6	0.63
DBP, mmHg	95.5 ± 15.0	94.9 ± 14.6	96.2 ± 15.5	0.41
FBS, mmol/l	5.8 ± 2.6	5.6 ± 2.0	6.0 ± 3.1	0.25
Total Cholesterol, mmol/l	5.1 ± 1.2	4.9 ± 0.53	5.2 ± 1.3	0.08
Triglyceride, mmol/l	1.4 ± 0.6	1.4 ± 0.7	1.4 ± 0.7	0.42
LDL Cholesterol, mmol/l	3.1 ± 1.1	3.0 ± 1.0	3.2 ± 1.1	0.39
HDL Cholesterol, mmol/l	1.4 ± 0.4	1.3 ± 0.39	1.4 ± 0.5	0.06
PCV, %	38.5 ± 5.3	38.5 ± 6.2	38.6 ± 4.7	0.94
WBC	6.2 ± 2.8	6.7 ± 1.2	5.7 ± 2.0	0.24

BMI = Body Mass Index, DBP = Diastolic Blood Pressure, FBS = Fasting Blood Sugar, HDL = High Density Lipoprotein, LDL = Low Density Lipoprotein, PCV =Packed Cell Volume, WBC = White Blood Count

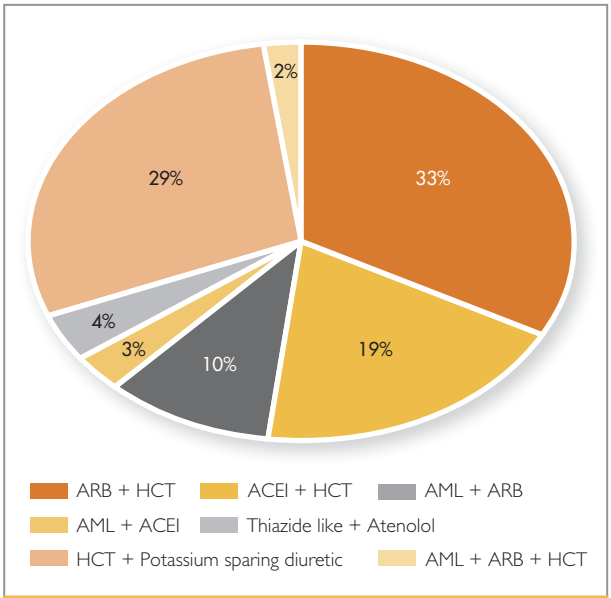

FIGURE 1: Percentage distribution of the use of different single pill combination medications.

DISCUSSION

Our study has shown that 56.8% of the 373 hypertensive patients studied received one form of SPC or the other with the most prescribed single pill combination being angiotensin receptor blocker plus thiazide diuretic. The proportion of 56.8% of our patients receiving SPC anti-hypertensive medications is much higher than the proportion of 20.0% recently reported in a study in Japan.[13] The higher rate of single pill prescription in our study compared to that in Japan might be attributed to the fact that our study was in a specialist cardiology clinic while the study in Japan was in both general and specialty clinics. It is well known that specialty physicians like cardiologists have a higher propensity of prescribing single pill anti-hypertensive combination medications compared to general physicians.[14] The proportion of 56.8% in our study is higher than the proportion of 17.3% recorded in the same cardiology clinic in 2013. Therefore, there has been much improvement in the prescription of single pill anti-hypertensive combination medications in our clinic over the years. This increase can likely be attributed to increased availability of SPC anti-hypertensive medications in Nigeria and increased awareness of our physicians on the advantages of SPC anti-hypertensive medications.

Combination of ARB and HCTZ was the most prescribed SPC, with combination of telmisartan and HCTZ being the most used in this regard. There was a higher tendency to prescribe ARBS plus HCTZ over ACEIs plus HCTZ, and AML plus ACIS or ARBS. A higher tendency for ARBS and HCTZ to be prescribed above combination of ACEIs plus HCTZ is most likely due to the better side effect profile of the former. It is well known that ACEI causes dry cough and angioedema and these side effects occur more in black patients compared to Caucasian population.[15] On the other hand, the higher prescription of ARBS plus HCTZ over combination of AML plus ARBS is most likely due to better availability and lower cost of the former.

HCTZ and amiloride were the second most commonly prescribed SPC in our study. A similar combination (HCTZ plus triamterene) was one of the most prescribed SPC in a study in the United States of America over a decade ago.[16] The choice of this combination over more contemporary combination therapies is likely due to its relatively lower cost compared to the other more conventional and reduction of hypokalaemia caused by HCTZ monotherapy. In the CREOLE study,[2] hypokalaemia was reported in over 5.3% of the patients who were on the combination of AML plus HCTZ even though this was the most efficacious of the 3 treatment arms in reducing BP. To mitigate this effect of hypokalemia, the triple combination of amlodipine, hydrochlorothiazide and amiloride could be a good option to be considered in the black population.

SPC of 3 medications of AML plus valsartan plus HCTZ was prescribed in 2.4% of the cases. With the burden of hypertension in the black population and difficult to treat blood pressure in this population group,[7,18] the use of such single triple pill combination could significantly improve compliance and therefore BP control.

In keeping with most current hypertension guidelines,[6-10] which discourage the combination of beta blockers and thiazide or thiazide-like diuretics because of increased metabolic side effects, the single pill combination of a beta blocker plus hydrochlorothiazide was prescribed in only 3.8% of the patients studied.

Similar to previous studies,[17] our female hypertensive patients had significantly higher body mass index and LDL cholesterol. The higher LDL cholesterol in female patients compared to male patients has been attributed to hormonal differences.[19]

LIMITATIONS

Since this report applies strictly to a cardiology clinic, it is difficult to extrapolate this to the general anti-hypertensive prescription pattern in tertiary health facilities in Nigeria.

CONCLUSION

Our study has shown that more than half of hypertensive patients attending a cardiology clinic in a tertiary health facility in Nigeria were prescribed single pill anti-hypertensive medications. Although results of this study cannot be extrapolated to the general anti-hypertensive prescription pattern in tertiary health facilities in Nigeria, it is a pivot for future studies in this direction. It might also be necessary to see how single pill anti-hypertensive medications affect blood pressure control when compared to individual medications in this population.

Conflict of interest: none declared.

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