Managing Hypertension In Heart Failure Patients In A Teaching Hospital In Ghana

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Abstract
The study was carried to establish hypertension as the major cause of heart failure in patients seen at the medicine directorate of a teaching hospital in Kumasi. The study also determined the efficiency of the pharmacotherapeutical management of hypertension in these patients. It was retrospective covering a 3-year period i.e. 2004 to 2006. It involved 307 heart failure patients consisting of 54.7% males and 45.3 females aged between 13 to 100 years with the age range of 53-60 years forming the majority. The median age of the patients was 54.6 years with a standard deviation of 18.12. The study was non-randomized and hence all heart failure patients who fell within these periods were used. Hypertension was found to be main cause of heart failure affecting 61.7% (n=189) out of the 307 patients who were admitted for heart failure. The patients had a mean systolic blood pressure of 148.2mmHg (SD.38.49) with the majority (28.7%) having systolic blood pressure in the range of 140-165mmHg. Their mean diastolic blood pressure was 92.60mmHg (SD. 22.32) with the majority (52.4%) having diastolic blood pressure in the range of 90-110mmHg. For asymptomatic heart failure patients with hypertension a thiazide diuretic was found be effective especially for elderly patients over 65 years. 23.8% of the patients in this study received the calcium-channel blocker, nifedipine to treat hypertension in heart failure, however, the newer calcium antagonists, felodipine and amlodipine were more effective in treating arterial hypertension in heart failure. 13.3% of the patients in this study received the β-blocker, carvedilol. Maximizing the dose of β-blockers and ACE-inhibitors, which extend survival in heart failure, was found be more effective than adding calcium-channel blockers to control hypertension. 41.7% of the patients in the study received low dose of the ACE-inhibitor, lisinopril (2.5mg-5mg) to treat symptomatic heart failure due to systolic left ventricular dysfunction, however, maximizing the dosage to 10mg-20mg was found to achieve a decrease in blood pressure as well as improved survival of the patients. The centrally acting drug, methyldopa was administered to 18% of the patients. A dosage of 250-1000 twice daily was found to effectively control their blood pressure. Although most of the patients were discharged with a decreased blood pressure levels the recommended target blood pressure levels of <140/90 or 130/80mmHg could not be achieved. This was due to the fact that most of the patients became asymptomatic and therefore were discharged to be reviewed at the cardiac clinic.

INTRODUCTION
Hypertension has been associated with an increased risk of heart failure in several epidemiological studies. In the Framingham heart study, hypertension was reported as the cause of heart failure either alone or in association with other factors in over 70% of cases, on the basis on non-invasive assessment(1). Hypertension predisposes to the development of heart failure via a number of pathological mechanisms, including left ventricular hypertrophy. Left ventricular hypertrophy is associated with left ventricular systolic and diastolic dysfunction and an increased risk of myocardial infarction and it predisposes to both atrial and ventricular arrhythmias. Electrocardiographic left ventricular hypertrophy is strongly correlated with the development of heart failure, as it is associated with a 14-fold increase in the risk of heart failure in those aged 65 years or under(16). There have been worrying reports recently both in epidemiology and clinical outcomes of hypertension in recent studies. Hypertension has been reported to account for up to 30% of hospital admissions for heart failure in West Africa(3) and the prognosis of hypertensive heart failure among black Africans has also been found to be poor(4). Amoah and Kallen found the main cause of heart failure in Accra, Ghana to be hypertension(5). Owusu, I., in Kumasi also found the main cause of heart failure to be hypertension(6).

Effective management of hypertension in heart failure will decrease stroke by 35-40%, myocardial infarction by 20-25% and congestive heart failure by 50%. The goal of treatment is to reduce cardiovascular and renal morbidity and mortality and vascular dementia by focusing on reducing
systolic blood pressure with objective of achieving blood pressure of <140/90 or <130/80 in heart failure patients with diabetes or renal disease(7,8).

Aggressive treatment strategies for hypertension in heart failure must begin with prevention, and hypertension represents a major contributing factor. Some have estimated that as many as 90% of persons with heart failure have an antecedent history of hypertension. However, data suggest that only 1/3 of patients have their blood pressure controlled(9). This low control rate is, in part, because of physician and patient behaviours that prevent achievement of blood pressure treatment goals. These behaviours include:

- Prescribing suboptimal drug doses or failure to escalate antihypertensive dose
- Reluctance to prescribe effective drugs due to their side effects
- Poor patient adherence to prescribed drugs

Therefore, to optimally treat heart failure patients with hypertension and achieve target pressure, these barriers must be overcome. Educating patients regarding the risks and consequences of non-adherence, minimizing tolerability issues and side-effects and simplifying dosing regimens may improve adherence to treatment and resulting outcomes.

Cochrane review updated in 2004 gives the oral antihypertensive drugs that are used in the management of hypertension in heart failure patients as below;

**Figure 1**

**Figure 2**
Table 2: Antihypertensive medication and co-morbid conditions

In managing hypertension in heart failure, the strategies to adapt are;

- minimize polypharmacy
- simplify treatment plan
- prescribe inexpensive drugs
- educate patients about disease and goal therapy
- review medications regularly and discontinue when not needed.
MATERIALS AND METHODS

STUDY TYPE

The study was a hospital-based retrospective descriptive carried out at the medicine directorate, Komfo Anokye Teaching Hospital in Kumasi covering a 3-year period from January 2004 to December 2006 involving 307 heart failure patients with hypertension.

SAMPLING METHOD

Heart failure patients aged between 13 and 100 years who were admitted at the medicine wards of the hospital were non-randomly used. Documentation of patients in the nurses’ admission and discharge books at the wards was poor and hence only patients who were properly documented within the said periods of the study were used.

DATA PROCESSING AND ANALYSIS

The data collected using the Data Collection Forms were entered separately into STATA Version 7.0 statistical software for analysis. Descriptive analysis of baseline parameters was provided and numbers and percentages were calculated.

LIMITATION OF STUDY

As a result of the retrospective nature of the study, some vital information on some patients could not be obtained due to poor documentations in the admission and discharge books at the wards. Some names and folder numbers retrieved from the admission and discharge books could not be traced from the medical records department. These had the potential of affecting the results and might have diluted the observed results.

RESULTS

307 patients were involved in the study comprising 168 males and 139 females who were admitted at the medical wards of the medicine directorate from January 2004 to December 2006.

DEMOGRAPHIC CHARACTERISTICS

Sex Distribution

Males formed 54.7% whiles females formed 45.3% of the patients in the study.
SYSTOLIC BLOOD PRESSURE OF PATIENTS

The patients had a mean systolic blood pressure of 148.2mmHg.

DIASTOLIC BLOOD PRESSURE OF PATIENTS

Drugs distribution

Table 9: drugs used and their frequency
DISCUSSION

The ages of the patients admitted with heart failure during the period under review ranged from 13 to 100 years with the range 53-60 years forming the majority i.e. 16.62%. The median age of the patients was 54.6 years with a standard deviation (SD) of 18.12. This correlates with the median age of 56.15 (18.5) reported by Owusu in his study of the causes of heart failure in Kumasi(6). A similar mean age of 53 (12.1) years was reported by Isezuo et al among Gambians and Nigerians with heart failure(4). However, Amoah and Kallen reported a low mean age of 42.3 (0.9) years in their study at the National Cardiothoracic Centre in Accra(5). This may be due to the many congenital heart cases reported at the centre and also being a national referral point, the centre sees a lot of patients of all ages.

Males constituted 54.7% and females made up 45.3% of heart failure patients in the study representing a ratio of 1.2:1.0. Amoah and Kallen also reported a similar ratio of 1.2:1.0 of male to female affected with the disease at the National Cardiothoracic Centre in Accra(5). This confirms available data(7,8) that heart failure affects more males than females. This is probably due to the fact that the incidence of hypertension is more prevalent in males than females and hypertension is a major cause of heart failure in the sub-region. The main causes of heart failure in this study were hypertension (61.7%). Data available shows that the main cause of heart failure in Africa is hypertension(7,8). This was reported as such by Owusu, in Kumasi(6) and Amoah and Kallen in Accra(5). Given the importance of hypertension, it is alarming that the awareness, treatment, and control rates of hypertension in Africa are as low as 20%, 10% and 1%, respectively(7,8). Owusu reported that the detection and control of hypertension remains a challenge even in developed countries, with as many as 70% of hypertensive patients with uncontrolled high blood pressure(6). 28.7% of the patients recorded a systolic blood pressure in the range of 140-165mmHg whiles the mean systolic pressure recorded was 148.2mmHg. 22.3% of the patients recorded a diastolic blood pressure of 92.6mmHg with as many as 52.4% recording a diastolic blood pressure in the range of 90-110mmHg. These results exceeded target blood pressure goals of <140/90 or 130/80mmHg as recommended by guidelines for the management of hypertension in heart failure (9). Physicians are often satisfied with decreasing blood pressure, even if blood pressure target is not achieved. The notion that reaching target diastolic blood pressure goals is satisfactory although systolic blood pressure remains high must be discarded. This is because for patients over 50 years, the systolic blood pressure has been shown to be more important to control than the diastolic blood pressure (10) in managing blood pressure in heart failure patients.

TREATMENT

Almost all the patients (98.7%) in this study received frusemide, a loop diuretic in accordance with the updated treatment guidelines for heart failure since all the patients were symptomatic. The frusemide was to manage fluid overload and to relieve the patients of symptoms like breathlessness. Strong clinical consensus(19) indicates that diuretics should be used to treat volume overload. A meta-analysis of several small trials also suggests that the use of diuretics reduce the risk of death and worsening heart failure(19). The dose should be carefully tailored to the individual patient to control fluid overload. All the patients had fluid overload either as pulmonary oedema, peripheral oedema or both. For asymptomatic heart failure patients with hypertension the initial recommended medication would have been a thiazide diuretic especially for elderly patients over 65 years.

As many as 23.8% of the patients in this study received nifedipine, to treat arterial hypertension in heart failure. Nifedipine, to treat arterial hypertension in heart failure. However, the antihypertensive and lipid-lowering treatment to prevent heart attack trial (ALLHAT)(15) and a recent meta-analyses(18) suggested that hypertensive heart failure patients treated with calcium-channel blockers are at risk for worsening heart failure. The updated guidelines recommend the use of the newer calcium antagonists i.e. felodipine and amlodipine to treat arterial hypertension in heart failure. 13.3% of the patients in this study received the β-blocker, carvedilol. Owusu, also found that only 17% of heart failure patients...
patients in his study received the β-blocker, carvedilol(5). However, maximizing the doses of β-blockers and ACE-inhibitors, which extend survival in heart failure, is preferred to adding calcium-channel blockers to control hypertension(16,17). Although 41.7% of the patients in the study received the ACE-inhibitor, lisinopril, dosage was low dose from 2.5mg-5mg to treat symptomatic heart failure due to systolic left ventricular dysfunction, maximizing the dosage to 10mg-20mg would have achieved a decrease in blood pressure as well as improved survival of the patients. A meta-analysis of 32 trials completed before 1995 that involved 7105 patients with heart failure concluded that ACE-inhibitors reduced the total mortality rate by 23% and the combined end point of death from or hospitalization for heart failure by 35%(17). Furthermore, long-term follow-up of these studies suggests that these benefits are sustained over many years.

The centrally acting drug methyldopa (i.e. Aldomet) was used in 18% of the patients to treat hypertension. A dosage of 250-1000 twice daily is recommended to lower blood pressure levels.

Although most of the patients were discharged with a decreased blood pressure the recommended target blood pressure levels of <140/90 or 130/80mmHg could not be achieved. This was due to the fact that most of the patients became asymptomatic and therefore, were discharged to be reviewed at the cardiac clinic.

CONCLUSION

Of all the diagnosis made in heart failure, hypertension is the most common cause. However, data suggest that only 1/3 of the patients have their blood pressure controlled. This is mainly due to physicians prescribing suboptimal drug doses or failure to escalate antihypertensive dose. The goal of treatment is to reduce cardiovascular and renal morbidity and mortality and vascular dementia by focusing on reducing systolic blood pressure with goal being <140/90 or <130/80mmHg with hypertensive heart failure with diabetes or renal disease. Initial recommended medication is a thiazide diuretic. After thiazide diuretics, the choice of antihypertensive medications is based on other co-morbid conditions. The newer calcium-channel antagonists, felodipine and amlodipine are recommended to treat hypertension in heart failure. Maximizing the doses of ACE-inhibitors and β-blockers will be sufficient to control hypertension in heart failure. Educating physicians and patients regarding the importance of treating to goal is a crucial step in overcoming barriers that prevent blood pressure goal achievement. Again the simplification of dosing may provide adherence benefits over a twice-or three-time daily drug. Overall, physicians must be confident that aggressive treatment will not result in an adverse benefit-to-ratio for the patient.

References

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