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ABSTRACT

ANAEMIA AND HEART FAILURE: A Retrospective Study at Charlotte Maxeke Johannesburg Academic Hospital

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INTRODUCTION

Anaemia has been associated with adverse outcomes in patients with chronic congestive cardiac failure in numerous international studies. There is a lack of local studies assessing the relationship between anaemia and heart failure.

AIMS

- To define the prevalence of co-morbid anaemia in patients attending the Heart Failure Clinic at Charlotte Maxeke Johannesburg Academic Hospital.
- To evaluate the relationship between anaemia and severity of heart failure.
- To compare anaemic and non-anaemic patient variables.
- To define the aetiology of heart failure in patients attending the Heart Failure Clinic at Charlotte Maxeke Johannesburg Academic Hospital.

METHODOLOGY

This is a single centre retrospective study of patients attending the Charlotte Maxeke Johannesburg Academic Hospital Heart Failure Clinic from January to June 2011. The patient files were analysed specifically for the presence of anaemia, New York Heart Association (NYHA) functional class, furosemide dose, six minute walk test and Minnesota Living with Heart Failure Questionnaire score. In addition, demographic data (age, gender) and the aetiology of heart failure were recorded.

Anaemia was defined by the World Health Organisation (WHO) criteria of a haemoglobin level <13 g/dl in men and < 12g/dl in women.

The control group consisted of participants attending the clinic who were not anaemic. The two groups were compared using:

a) Participant's symptom scores; using the Minnesota Living with Heart Failure Questionnaire (MLHFQ - Appendix B).
b) Objective measurements of the participant's state of health:
    - Six minute walk test
    - Dose of furosemide (Lasix)
    - New York Heart Association (NYHA) functional class

RESULTS

A total of 282 files were reviewed over 6 months from the Heart Failure Clinic at Charlotte Maxeke Johannesburg Academic Hospital. Sixty-two files were excluded from the study due to lack of study data recorded in the file. Data was collected and entered into a database which was analysed using the Statistics/Data Analysis Program (STATA) Version 10.0. Mean age of the study group was 59.8 years (SD±12.2), with the youngest subject aged 22 years and the oldest 91 years.

The mean haemoglobin concentration was 13.79 g/dl (SD±1.96). The mean haemoglobin in men was 13.83 g/dl (SD±1.97) and in females the mean haemoglobin was 13.79 g/dl (SD±1.96). The overall prevalence of anaemia in the sample population was 21.4% (47 anaemic patients). The prevalence of anaemia in

males and females was 15.8% and 26.1% respectively. Seventy-two patients (32.7%) had ferritin levels recorded and one patient (0.01%), who happened to be female, was iron deficient based on serum iron studies (Ferritin < 15 µg/L). None of the male subjects was iron deficient.

An insignificant inverse relationship between haemoglobin concentration and Minnesota score (p=0.452) was found. No correlation was found between haemoglobin concentration and furosemide dosage in this study (p=0.123). Analysis of haemoglobin concentration and the six minute walk test yielded a positive correlation which was statistically significant (p=0.001).

The Analysis of Variance Test (ANOVA) showed a significant association between the haemoglobin level across the different NYHA functional classes (p=0.03). The prevalence of anaemia in NYHA class I, II and III was 9.2%, 12.1% and 51.7% respectively. None of the subjects were documented as being NYHA functional class IV.

DISCUSSION

The overall prevalence of anaemia in this study was 21.4%, which is consistent with international studies.

Although an inverse relationship between haemoglobin concentration and Minnesota score was found, it was statistically insignificant (p=0.452). Lower haemoglobin levels are associated with higher Minnesota scores which reflect greater severity of heart failure based on patient's symptoms. Anaemic patients with heart failure are more likely to have poorer quality of life scores.

The finding of a positive correlation between haemoglobin concentration and the six minute walk test confirms that higher haemoglobin levels are associated with better effort tolerance and lower severity of heart failure, which is consistent with many international studies.

No correlation was found between haemoglobin concentration and furosemide dosage in this study (p=0.123). One would have expected higher doses of furosemide with lower haemoglobin levels as higher furosemide doses are associated with more severe heart failure. The reason for this discrepancy is probably due to the fact that many of the patients in the heart failure clinic are treated with other diuretics (eg. spironolactone, hydrochlorothiazide) in addition to furosemide.

The statistically significant association between NYHA functional class and haemoglobin supports the findings that anaemia is associated with poorer functional class. Patients classified as NYHA III had a mean haemoglobin of 11.9 g/dl, whereas NYHA I patients has a mean haemoglobin of 13.98 g/dl. The highest prevalence of anaemia (51.7%) was found in NYHA class III patients.

Dilated cardiomyopathy was the commonest cause of heart failure (34.1%) followed by hypertensive heart disease (21.4%), ischaemic heart disease (18.6%) and alcoholic cardiomyopathy (8.6%).

CONCLUSION

The findings of this study confirm that anaemia is common in heart failure patients. The study also found anaemia to be more prevalent in patients with more advanced heart failure, thus making anaemia a potential prognostic factor in patients with heart failure.