Impact of N-acetylcysteine on endothelial function, B-type natriuretic peptide and renal function in patients with the cardiorenal syndrome: a pilot cross over randomised controlled trial

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BACKGROUND
Both heart and renal failure are characterised by increased systemic oxidative stress and endothelial dysfunction and occur in the cardiorenal syndrome (CRS). The aim of the present study was to assess the impact of N-acetylcysteine (NAC), a potent antioxidant, on endothelial function, B-type natriuretic peptide (BNP) and renal function in patients with CRS.

METHODS
In a double blind, placebo controlled manner, we randomised nine stable outpatients with both heart failure (LVEF<40% and NYHA class II or III) and renal failure (Cockroft Gault clearance of 20-60ml/min) to placebo or NAC (500mg orally twice daily) for 28 days followed by a wash out period (>7 days) and crossover to the other treatment.

RESULTS
Eight patients completed the study and all data (N=9) was used in the analysis. Mean forearm blood flow improved significantly with NAC with mean ratio of improvement of 1.99 (SEM: ±0.49) for NAC and 0.73 (SEM: ±0.23) for placebo with a p-value of 0.047. There was no significant difference in BNP (p=0.25), renal function (p=0.71) or NYHA class (p=0.5). No deaths occurred during the trial.

CONCLUSION
In this pilot trial of patients with CRS, NAC therapy was associated with improved forearm blood flow. This may represent a general improvement in endothelial function and warrants further investigation of antioxidant therapy in these patients.

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