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EFFECTS OF ENVIRONMENTAL TEMPERATURE ON NON-INVASIVE HAEMODYNAMICS IN PATIENTS WITH HEART FAILURE

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Background Home Telemonitoring may improve the management of patients with heart failure, reducing morbidity and mortality. Consequently, there is a growing interest in the use of non-invasive devices for remote monitoring of cardiovascular function. The physiological impact of environmental factors such as temperature on haemodynamic recordings in patients with heart failure has not been explored.

Design and methods Patients with a clinical diagnosis of heart failure, receiving loop diuretics and with objective evidence of cardiac dysfunction were enrolled. A control group without heart failure was also enrolled. Continuous beat-to-beat pulse contour analysis was undertaken using finger-tip, volume-clamp (Nexfin, Bmeye, Netherlands) to measure haemodynamics on separate days at cool (19°C) and warm (28°C) room temperatures in the supine position and during light exercise.

Results Haemodynamic data were obtained from a total of 12 men with stable heart failure (HF) aged between 46 and 90 years (mean, 72±13 years) and 6 patients (5 men and 1 woman) with hypertension (HTN) aged between 51 and 75 years (mean, 67±9 years). Mean LVEF was 32±12% while the median NT-proBNP was 1207 (IQR 431–3506) pg/ml in the HF cohort. Mean LVEF was 57±5% while median NT-proBNP was 103 (IQR 48–178) pg/ml in the HTN group. Measurements at higher ambient temperatures induced vasodilation with a fall in BP and a rise in CI.

Conclusions Changes in environmental temperature have marked effects on haemodynamics which can be detected non-invasively with telemonitoring devices. Local environmental conditions

should be taken into account as they may be important for interpretation of data. Control of environmental temperature should be explored as a potential adjunct to therapy in patients with heart failure. Longer term studies are required to assess effects on fluid balance.