with 41% and 40% of appointments respectively. A median of 8 minutes was spent by clinicians between patients. Patients’ median total waiting time, i.e. time spent in hospital by patients outside of consultations and tests, was 64.5 minutes (IQR 31.75 – 94.5). New patients had longer consultations on average, with a median of 28.5 minutes (IQR 21.5 – 37) compared with 18.5 minutes for follow-up appointments (IQR 13 – 24) (p = 0.018) and spent longer in hospital than follow-up patients (median time 150.5 minutes vs 101 minutes, p = 0.040). Estimated travel times were a median of 45 minutes in each direction (IQR 29 – 87), and therefore a median of 90 minutes for a round trip. The estimated combination of travel time and time spent in hospital was a median of 190 minutes (IQR 149 – 283). Figure 2 illustrates the breakdown of total patient time spent in consultation, investigation, waiting or in travel.

Conclusion Most clinic appointments were delayed. Most patient time was spent in travel and waiting between activities on the day of a HF clinic appointment. There is huge scope for improvement in clinic efficiency and patient convenience by rationalisation of clinic services and increased use of telemedicine in HF.

Conflict of Interest Dr Singhal’s salary is funded by a fellowship from Abbott

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**Abstract 141**

**Figure 1**

**Abstract 141** Figure 2

**Abstract 142**

**Figure 1**

**Formulae used to calculate plasma volume status**

**Hakim Formula**

\[
\text{Actual Plasma Volume (mL)} = (1 - \text{hct}) \times (A + (B \times \text{weight in kg})) \\
A = 1530 \text{ for men; } A = 864 \text{ for women; } B = 41 \text{ for men; } B = 47.9 \text{ for women}
\]

**Ideal Plasma Volume (mL)**

\[
C \times \text{weight in kg}
\]

\[
C = 39 \text{ for men; } C = 40 \text{ for women}
\]

\[
\text{Plasma volume status} = \frac{\text{Actual plasma volume} - \text{ideal plasma volume}}{\text{ideal plasma volume}} \times 100
\]

**Duarte Formula**

\[
\text{Plasma volume status} = \frac{100 - \text{haematocrit} (\%)}{\text{haemoglobin} (\text{g/dL})}
\]

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**Abstract 142**

**Figure 1**

**ESTIMATIONS OF PLASMA VOLUME STATUS IN PATIENTS WITH CHRONIC HEART FAILURE: A USEFUL TOOL FOR DIAGNOSING AND TREATING CONGESTION?**

Joe Cuthbert. Hull University Teaching Hospitals NHS Trust, Hull, UK

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**Introduction** Neurohormonal activation in patients with chronic heart failure (CHF) causes plasma volume expansion which, if untreated, leads to overt venous congestion. Plasma volume status (PVS) can be estimated using formulae based on a patient’s sex, weight, haemoglobin and haematocrit. Such non-invasive methods to assess congestion may be useful, particularly in the wake of the COVID-19 pandemic. We compared the clinical value of two measures of PVS in a cohort of unselected outpatients with CHF (The Hull LifeLab).
Methods Patients with an echocardiogram, N-terminal pro B-type natriuretic peptide (NTproBNP) and complete data on signs and symptoms were evaluated (n=3505). CHF was defined as signs and symptoms of the disease and either left ventricular systolic dysfunction (LVSD) worse than mild, or LVSD mild or better and raised N-terminal pro-B-type natriuretic peptide (NTproBNP) levels (>125 ng/L). Two formulae to estimate PVS were used: (a) Hakim formula (based on estimations of actual and ideal plasma volume calculated from weight and haemoglobin - H-PVS); and (b) Duarte formula (calculated from haematocrit and haemoglobin – D-PVS) (figure 1). Patients were split into quartiles of H-PVS and D-PVS. Variance inflation factor (VIF) was used to assess co-linearity between both measures and other variables. Outcome measures were all cause mortality, and mortality or heart failure hospitalisation. Multivariable Cox regression, Harrell’s C-statistic and Akaike’s Information Criterion (AIC) were used to assess the prognostic utility of each measure of PVS.

Results Patients in the highest quartile (most congested) of D-PVS or H-PVS had higher NTproBNP levels, were more likely to have severe symptoms and signs, and be prescribed a loop diuretic than those in lower quartiles (table 1 and 2). Patients in the highest quartile paradoxically weighed much less than those in those lowest quartiles. H-PVS and D-PVS were strongly correlated with one another (r=0.79; P<0.001) but had only modest positive correlations with log[NTproBNP].
A SINGLE CENTRE STUDY ASSESSING THE EFFECTIVENESS OF ACTIVE MONITORING, USING TELEMEDICINE, IN PREVENTING HEART FAILURE ADMISSIONS AND DEATH IN A PRIMARY CARE POPULATION WITH SYSTOLIC HEART FAILURE

Nicola Bowers, Josephine Chaplin, Piers Clifford, Ben Lodge, Charlie Clifford, Ricardo Pio Monti, Marc Phippin, Buckinghamshire Healthcare NHS Trust, Buckinghamshire, UK; University College; Janssen Healthcare Innovation

Introduction Patients with systolic heart failure are at high risk of admission to hospital and death. This can be reduced by ensuring that they are receiving all evidence-based heart failure medications and by detecting early signs of deterioration in their condition.

Methods Patients were enrolled from 2016 through 2017 at 12 GP practices across Buckinghamshire. Practices were selected if the used EMIS web as their electronic patient record and showed enthusiasm for participating in the study. At each practice, a senior heart failure nurse was deployed to identify patients with a REED code for heart failure and an echocardiographically determined ejection fraction (EF) of less than 40%. If no echocardiogram was available this was arranged. We recruited 209 primary care patients with echocardiographically proven left ventricular systolic dysfunction (ejection fraction<40%). 84 patients consented to be actively monitored by the heart failure team using telemedicine. It automatically uploaded any relevant data (weight, dyspnoea class, renal function, full blood count, urate, chest X-ray, repeat echocardiogram, hospital admissions, death) entered in the GP or hospital records. Patients were also encouraged to enter their own data (in particular weight and exercise tolerance). Clinicians were instructed to treat patients in accordance with national guidelines for the management of heart failure. 125 patients consented to receiving usual care but allowing access to their medical records. The primary endpoint was cardiovascular death or admission to hospital for heart failure at 1 year. Secondary endpoints included the prescription of evidence-based heart failure medications and patient satisfaction at the end of the study.

Results There was no difference in the mortality rate between the groups (6.02% in the active group and 5.56% in control). There was an evident difference in hospital admission (10.84% in the active group and 1.59% in control); p-value of 0.0078). At the end of the study, in the active group a control group, 92% v 52% of patients were on a beta-blocker, 92% v 48% on ACE-I/ARB, and 60% v 30% on an MRA. There were no differences in the final doses achieved.

Conclusions Active telemonitoring in an elderly population with systolic heart failure did not reduce cardiovascular mortality or admission to hospital for heart failure over the 1 year of the study. It did result in more patients receiving evidence-based heart failure medications. Overall satisfaction with active monitoring delivery a questionnaire was provided to all patients who opted to receive active monitoring. The purpose of the questionnaire was to determine overall satisfaction levels with the monitoring and identify areas for potential improvement. A questionnaire was circulated at the midpoint of the study (6 months) as well as at its conclusion (12 months). Of all patients in the active control group, a total of 27 completed both questionnaires (corresponding to 32.53% of all patients under active monitoring). The characteristics of this subset of the active cohort were consistent with the overall characteristics of all patients in the study; there was no significant differences in cardiovascular status (e.g., NYHA scores) or personal characteristics (e.g., gender, age).

The questionnaire consisted of a eleven questions measuring the patient satisfaction on various aspects of the active monitoring treatment. The overall response from patients was positive, with an average satisfaction of 8.54 / 10. Furthermore, when asked how likely they would be recommend the active monitoring treatment, patients gave an average score of 8.34 / 10.

Conflict of Interest None