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Project Title

Outcome assessment of heart failure patients in Hull and East Yorkshire under Tele Health care

Abstract

Introduction: With better treatment and the aging population it is expected that the number of Heart Failure (HF) patients will increase along with the cost of care. In the UK 900,000 people have HF which accounts for 1 million inpatient bed days and 5% of all emergency medical admissions to hospital (NICE, 2010). It is expected that 30-40% of HF patients will die within the first year (NICE, 2010) along with 30% having a hospital readmission within 90 days (Zhang et al., 2013). Cleland et al. (2011) estimates that the cost of managing HF is £563 million per year in England and Wales. Home Tele Health (HTH) and Home Tele Monitoring (HTM) have been trailed as one of the many ways to help meet these challenges. Results from these trials have been mixed with some reporting improvements in mortality rates (Antonicelli et al., 2008; Cleland et al., 2005) and with others not showing any improvement (Wade et al., 2011; Koehler et al., 2011). This is similar for hospitalisation with some showing a reduction in hospitalisation during the trial (Weintraub et al., 2010; Steventon et al., 2012) and others not showing a reduction (Lynga et al., 2012; Mortara et al., 2009). Both HTH and HTM has been limited to trials, pilot programmes and test installations and has not widen up its use in routine clinical practice. This is mainly due to the mixed results reported in trials and the complexity of bringing HTH into routine care. Comparative effectiveness of HTH in routine care is therefore largely unknown.

Aims and Objectives: The aim of the work is to assess the comparative effectiveness of HTH compared with routine care in Hull and East Yorkshire using a longitudinal HF dataset. The outcomes will be used in the development of a framework for a more effective deployment of HTH in terms of both patient outcomes and resource usage.

Methods: Our work makes use of the Hull-Lifelab dataset which contains data for 6,000 Heart Failure patients (Clark, 2014) which is a longitudinal dataset and is representative of the heart failure patient population in Hull and East Yorkshire. The dataset contains a number of patients which took part in different clinical trials including patients which took part in a HTH trial. To remove imbalances in patient baseline characteristics between HTH and routine care individuals, propensity matching is used to estimate unbiased HTH effects.

Results: The propensity matching process matched 101 HTH patients with 101 routine care patients. The patients had a median age of 68.3 (+/- 12.5), a mean BMI of 29 (+/- 7.7) with 25.7% being females. 39.6% of the patients where NYHA >= 3 and 15.6% had previous Myocardial Infarction. In a univariate Cox regression analysis patients under routine care experienced an increased risk of death within one year (HR: 3.196, 95% CI 1.404 to 7.277, p<0.01) than those receiving HTH. Using a first-event composite endpoint of 1 year mortality and hospitalisation the routine care group had a slightly increased risk however this was not statistically significant (HR: 1.106, 95% CI 0.7711 to 1.587, p=0.584).

Conclusion: Adjusted for patient baseline differences, heart failure patients under HTM had a lower mortality rate than heart failure patients receiving routine care. Future work will also include other outcome metrics such as length of stay and associated costs. It is envisaged that this will result in a more effective deployment of HTH in terms of both patient outcomes and resource usage.

Acknowledgement

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