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MOBILE PHONE-BASED REMOTE PATIENT MONITORING IMPROVES HEART FAILURE MANAGEMENT AND OUTCOMES: A RANDOMIZED CONTROLLED TRIAL

ACC Poster Contributions

Ernest N. Morial Convention Center, Hall F

Monday, April 04, 2011, 3:30 p.m.-4:45 p.m.

Session Title: Outcomes in Heart Failure

Abstract Category: 45. Biomedical Computing/Information Technology

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Background: Remote patient monitoring of heart failure patients has been shown to improve health outcomes. However, the efficacy of a mobile phone-based remote monitoring system is unknown. The objective of this randomized controlled trial was to determine the effects of mobile phone-based remote monitoring on heart failure management.

Methods: The remote monitoring (RM) group (N=50) took daily weight and blood pressure readings, weekly single-lead ECGs, and answered daily symptom questions on a mobile phone for 6 months. Readings were automatically transmitted wirelessly to the mobile phone and then to data servers. Alerts were sent to the patients and clinicians as required. The control (SC) group (N=50) was provided with standard of care. Paired Student t-tests and Wilcoxon signed-rank tests (for normally and not normally distributed data, respectively) were performed on baseline and post-study blood tests and survey responses.

Results: Approximately 70% of RM patients completed at least 80% of their daily readings over the 6 months. The Brain Natriuretic Peptide (BNP) blood tests improved significantly only for the RM group (decrease of 178 pg/mL, $p=.001$) once the effect of the clinic was reduced by removing the patients who were enrolled into the clinic for less than 6 months (35 out of 100 participants). Quality of life measured with the Minnesota Living with Heart Failure Questionnaire also improved only for the RM group (decrease of 14 points, $p=.02$) using all patient data. Self-care maintenance ($p=.05$) and management ($p=.03$) measured with the Self-Care of Heart Failure Index had an improvement for only the RM group after removing new patients in the analysis. No differences were found between the RM and SC groups in terms of hospitalization or emergency department visits.

Conclusion: Mobile phone-based remote monitoring systems are a scalable and cost-effective form of remote patient monitoring. In this study, we showed that a mobile phone-based remote monitoring system improved heart function, quality of life, and self-care. To achieve these positive outcomes, reductions in healthcare resource utilization might not immediately occur, but savings could be realized in the long-term.