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Late Breaking Abstract - AI-empowered multi-sensor home monitoring for early detection of acute pulmonary exacerbations in adults with non-cystic fibrosis bronchiectasis.

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Introduction

Acute pulmonary exacerbations (APEs) have a considerable impact on morbidity, mortality and quality of life for people with non-Cystic Fibrosis (CF) bronchiectasis (NCFB) and are currently impossible to predict. Our previous home monitoring studies in people with CF have shown that: routine outpatient attendance can be safely reduced by 50%; participants felt empowered monitoring their health at home; and AI algorithms can reliably detect APEs 10 days earlier than conventional management. We therefore sought to assess the utility and acceptability of home monitoring in people with NCFB and to collect data to train a bespoke AI predictive model.

Aims

The aim of this study was to determine if home monitoring data and artificial intelligence can be used to detect APEs before they become clinically apparent in patients with NCFB. Secondary aims included to assess user acceptability of home monitoring through focus groups.

Methods

This was a prospective, observational study in fifty adults with NCFB attending Royal Papworth Hospital for treatment of APE. Participants recorded lung function, activity, heart rate, oxygen saturations, weight, coughing, wellness and nebuliser adherence using equipment linked to a smartphone app.

Results

Median (range) participant demographics were; age 68.5 years (21-84), FEV1% predicted 68.0% (32-106). 58% were female. 80% found that entering home monitoring data improved understanding of their condition. We were able to define a typical exacerbation pattern and train a model to accurately predict APEs.

Conclusion

AI empowered home monitoring shows promise as a method to improve clinical management of NCBE. Larger prospective studies are needed to evaluate these models further.

