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USABILITY, FEASIBILITY, AND EFFECTIVENESS OF CONTINUOUS COUGH FREQUENCY MONITORING WITH HYFE COUGH TRACKER IN PATIENTS WITH CHRONIC COUGH

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Background & question: Objective cough frequency is a major outcome in clinical trials of anti-tussive therapy, but also the measurement may be potentially useful and provide further insights in the management of chronic cough patients in the real world. What is the usability, feasibility, and effectiveness of Hyfe Cough Tracker, a smartphone application-based continuous cough monitoring tool, if it is introduced to clinical practice of patients with chronic cough?

Method: Patients with chronic cough were prospectively recruited from two referral cough clinics in South Korea. While receiving usual care, they underwent continuous cough frequency monitoring for 1-2 weeks using the Hyfe Cough Tracker. Patients were evaluated using the Leicester Cough Questionnaire (LCQ) and cough severity numerical rating scale (NRS) (0-10) at baseline and follow-up visits. They also recorded daily cough severity NRS. Adherence was defined as the proportion of a time operated per expected. User experience and feasibility was assessed using a 5-point Likert scale and open-ended questions. Correlations between cough frequency and subjective cough scores were evaluated.

Results: A total of 65 chronic cough patients were recruited, and 50 patients (median age 45.5 years old [IQR 32.8 to 60.3]; female 74.0%) completed the follow-up visits between 1 and 2 weeks. The average set-up time required for the Hyfe installation and instruction was 196±38.1 seconds. Seventy percent of the patients responded that the monitoring was helpful overall, and 85% found it easy-to-use. The acceptability rate was 86% (50% highly acceptable and 36% acceptable). Physicians reported that the continuous monitoring helped understand cough frequency and temporal patterns and check treatment responses in 90.3% and 80.6% of cases, respectively.

Average duration of cough monitoring was 11.4±3.7 days. Overall adherence rate was 0.74±0.29 during the period; and the adherence was considered fair (>0.70) in 70% (n=35), good (>0.80) in 58% (n=29), and excellent (>0.90) in 40% (n=20). Patients with good adherence (>0.80) were significantly younger than counterparts (≤0.80) (median 37.0 years old [IQR 29.5 to 53.0] vs. 54.0 [44.5 to 64.0]; p=0.003). Baseline cough frequency, severity, and LCQ scores did not significantly differ between two groups; however, patients with good adherence had significantly lower LCQ scores at follow-up visits (median 12.2 [IQR 8.8 to 15.7] vs. 16.1 [12.8 to 18.4]; p=0.019).

Effectiveness was evaluated in 20 patients with excellent adherence (>0.90). Hourly cough rates decreased from median 9.9 coughs/hr (IQR 4.2 to 19.8) at baseline to 3.4 coughs/hr (1.7 to 13.4) at follow-ups. Daily cough severity scores decreased from median 6.5 (IQR 3 to 7) to 3 (2 to 4.5). In Spearman correlations, baseline LCQ scores were moderately correlated with hourly cough rate on day 1 (r=-0.341, p=0.017). In day-matched data, the Spearman correlation coefficient was 0.446 between daily cough frequency and cough severity NRS scores. The changes of hourly cough rates (from baseline to follow-up visit day) also showed moderate correlations with the changes of cough severity NRS (r=0.546, p=0.013).

Conclusion: This study suggests that continuous cough frequency monitoring with Hyfe Cough Tracker is potentially useful and applicable to real-world practice of patients with chronic cough.