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| **Personal spirometry appears accurate and feasible for remote lung function monitoring across multiple chronic lung conditions and varying patient ages.** |
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| **Introduction/Aim:** Spirometry is an essential tool for physicians diagnosing and monitoring respiratory conditions. However currently spirometry is underutilised, with accessibility being a contributory factor. Smartphone connected spirometry mitigates this challenge. We have previously shown that home spirometry is accurate and feasible in a mixed population when compared to gold standard desktop spirometry. This study assessed whether the accuracy of personal spirometry varied with chronic respiratory conditions or age.  **Methods:** Subjects with chronic respiratory conditions (Asthma, COPD, Bronchiectasis, Interstitial Lung Disease (ILD)) diagnosed by a respiratory physician were recruited through two separate institutions to perform spirometry on a standard desktop spirometer (MGC diagnostics) and a personal ultrasonic spirometer (SpiroHome). Unsupervised home testing was subsequently conducted using SpiroHome (2 tests/week for 3 weeks).Comparison between desktop and personal spirometry including supervised and unsupervised spirometry and between different respiratory conditions and ages were compared by Bland Altman analysis (%Bias +/-CI) and Pearson Correlation. Two-way ANOVA was used to compare FEV1 and FVC results across disease groups and home test sessions.  **Results:** The median age of the 91 participants was 62.6 and 37 (39%) were male. 19 healthy controls, 22 with Asthma, 16 with COPD, 17 with Bronchiectasis and 17 with ILD. Between all groups a good agreement was observed between desktop and HomeSpiro for both FEV1 and FVC (r=0.97, p=<0.0001). Precision analysis is ongoing, however there has been early signalling to suggest there may be differences in the COPD cohort (Table1). Which may be a result of the prolonged expiration in this group. Ages were characterised into five groups based on corresponding generation. There is an indication that older patients were less likely to meet ATS/ERS criteria for at home spirometry, analysis ongoing to further assess this.  Table 1: Analysis of percentage of FEV1 and FVC that met ATS/ERS criteria per Respiratory conditions   |  |  |  |  | | --- | --- | --- | --- | | Cohort | 100% of tests measuring FEV1 Met ATS/ERS (%) | 100% of tests measuring FVC Met ATS/ERS (%) | % of Home Spirometry that met ATS/ERS for all tests (%) | | Control | 16/19 (84) | 16/19 (84) | 16/19 (84) | | Asthma | 18/22 (81) | 15/22 (68) | 15/22 (68) | | COPD | 9/16 (56) | 4/16 (25) | 3/16 (19) | | Bronchiectasis | 10/17 (59) | 11/17 (65) | 11/17 (65) | | ILD | 12/17 (70) | 14/17 (82) | 11/17 (65) |   Table2: Analysis of percentage of participants per age group that met ATS/ERS criteria for all tests   |  |  |  | | --- | --- | --- | | Generational Groups | Participants (n) | % Home Spirometry that met ATS/ERS for all tests (%) | | Group 1 (18-28) | 8 | 6/8 (75) | | Group 2 (29-43) | 12 | 9/12 (75) | | Group 3 (44-58) | 19 | 15/19 (79) | | Group 4 (59-76) | 43 | 23/43 (54) | | Group 5 (77-88) | 9 | 5/9 (55) |   **Conclusion:** Findings indicate that lung function assessed by SpiroHome compares well with in-clinic standard desktop spirometry across most diseases in both settings. However there is early signalling to suggest there may be a difference in precision in patients with COPD and of older age.  **Key Words:** Personal spirometry, chronic respiratory disease  **Grant Support:** Institute for Respiratory Health, Novartis, and the Margaret Lowman-Hall honours scholarship stipend. Inofab has provided temporary free access to their online portal. |