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The relationship between peak cough flow and respiratory function testing (spirometry), and the factors that influence this, post bilateral sequential single lung transplantation: a cross-sectional feasibility study at a single centre cardiothoracic transplantation unit


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BACKGROUND

- Chronic lung allograft dysfunction (CLAD) is the leading cause of mortality post bilateral sequential single lung transplantation (BSSLTx)
- CLAD is associated with recurrent respiratory tract infections (RTI)
- Adequate cough strength is the main defence mechanism against RTI and this is known to be impaired post BSSLTx
- Peak cough flow (PCF) is a recognised clinical predictor tool in other disease populations with normal adult PCF 440-1200 L/min
- PCF ≥ 270 L/min = adequate cough, PCF ≤ 160 L/min = inefficient cough

AIMS

- To evaluate the feasibility of recruitment and conducting PCF testing alongside standard care
- To examine the relationship between PCF and spirometry: forced vital capacity (FVC) and forced expiratory volume in one second (FEV)
- To examine other factors that influence PCF

RESULTS

- Study methods feasible
- 91.90% recruitment rate, PCF test well tolerated
- n = 34 (61.8% male, 91.7% white British)

Table 1: participant characteristics (mean (SD) unless otherwise stated)

| Age (years) | 58.50 (17) |
| Height (cm) | 168.84 (11.01) |
| Weight (kg) | 72.02 (18.83) |
| BMI kg/m² | 25.12 (24.60) |
| FVC (L/sec) | 3.25 (1.07) |
| FEV₁ (L/sec) | 2.66 (1.09) |
| PCF (L/min) median (IQR 25-75%) | 220 (150) |
| Total hospital LOS (days) median (IQR 25-75%) | 35.50 (30) |
| Time elapsed post BSSLTx (days) median (IQR 25-75%) | 972 (1692) |
| EQ-5D-5L™ VAS Score (0-100) | 72.56 (17.23) |
| EQ-5D-5L™ Value State (0-1) median (IQR 25-75%) | 0.82 (0.23) |

METHODS

- Baseline characteristics collected
- FVC and FEV₁ measured by pneumotachograph on day of PCF testing
- Best of 3-5 PCF attempts measured with portable peak flow meter (mini Wright Standard Range Peak Flow Meter™)
- Health related quality of life (HRQoL) measure (EuroQol EQ-5D-5L™) completed

CONCLUSION AND RECOMMENDATIONS

- CLAD classification had moderate or strong negative correlations with PCF, FVC and FEV₁
- CLAD severity found to be worse dependant on time elapsed post BSSLTx
- A larger longitudinal study needs to be carried out with an increased sample size (estimated to be 244), revised sampling technique and consideration of additional respiratory outcome measures such as respiratory muscle testing

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References: