

Table 1. Demographic data of the patients with COPD and control subjects

| Variables | COPD n = 71 | Control n = 70 | P |
|-----------------------|------------------|---------------------|--------|
| Age (years) | 64.73 ± 8.16 | 63.07 ± 7.42 | 0.208 |
| Gender n (%) | | | |
| Female | 6 (%8.5) | 5 (%7.1) | 0.772 |
| Male | 65 (%91.5) | 65 (%92.9) | |
| BMI | 24.84 ± 4.24 | 25.73 ± 2.07 | 0.114 |
| Smoking history n (%) | | | |
| Never smoker | 4 (%5.6) | 33 (%47.1) | <0.001 |
| Ex-smoker | 48 (%67.6) | 28 (%40) | |
| Active smoker | 19 (%26.8) | 9 (%12.9) | |
| Smoking (packs/year) | 40 (26.25–55) | 30 (20–40) | 0.004 |
| 6MWT (m) | 335 (227–408.6) | 457 (408–499) | <0.001 |
| 6MWT (%) | 60 (42–73.89) | 89.84 (84.34–93.77) | <0.001 |
| CAT | 12 (8–20) | 1 (0–2) | <0.001 |
| mMRC | 2 (1–2) | 0 (0–0) | <0.001 |
| BODE | 3 (1–5) | 0 (0–0) | <0.001 |
| FVC (L) | 2.77 ± 0.73 | 3.79 ± 0.65 | <0.001 |
| FVC (% pred) | 76.65 ± 16.07 | 100.54 ± 11.79 | <0.001 |
| FEV1 (L) | 1.54 (1.12–1.93) | 3.11 (2.64–3.34) | <0.001 |
| FEV1 (%) | 54.27 ± 15.55 | 101.78 ± 12.2 | <0.001 |
| FEV1/FVC | 57 (49–64) | 78.86 (76.62–82.80) | <0.001 |
| Fall history, n (%) | 24 (33.8) | 10 (14.3) | 0.007 |

Values are n (%), mean ± standard deviation, or median (25th and 75th interquartile range). Abbreviations: BMI, Body mass index; 6MWT, 6-min walk-test; CAT, COPD assessment test; mMRC, Modified Medical British Research Council dyspnea questionnaire; BODE, BMI (B), airflow obstruction (O), dyspnea (D) and exercise capacity (E); FVC, forced vital capacity; % pred., percent predicted; FEV1, forced expiratory volume in 1 s.

Table 2. Balance test results of the patients with COPD and control subjects

| Variables | COPD n=71 | Control n=70 | P |
|----------------------|-----------------|------------------|--------|
| BBS, n (%) | | | |
| Impaired balance (+) | 32 (45.1) | 19 (27.1) | 0.027 |
| Impaired balance (–) | 39 (54.9) | 51 (72.9) | |
| BBS | 48 (39–51) | 49.5 (45–52) | 0.003 |
| SLS, n (%) | | | |
| Impaired balance (+) | 57 (80.3) | 35 (50) | <0.001 |
| Impaired balance (–) | 14 (19.7) | 35 (50) | |
| SLS (seconds) | 14.3 (4.3–25.3) | 29.4 (20.5–35.1) | <0.001 |
| 5STS, n (%) | | | |
| Impaired balance (+) | 66 (93) | 35 | <0.001 |

| | | | |
|----------------------|------------------|------------------|--------|
| Impaired balance (–) | 5 (7) | 35 | |
| 5STS (seconds) | 18.2 (15.2–22.1) | 13.2 (12.5–14.4) | <0.001 |
| FSST, n (%) | | | |
| Impaired balance (+) | 49 (69) | 30 (42.9) | 0.002 |
| Impaired balance (–) | 22 (31) | 40 (57.1) | |
| FSST (seconds) | 16.3 (14.2–20.2) | 14.7 (13.4–16.3) | 0.001 |
| TUG, n (%) | | | |
| Impaired balance (+) | 38 (53.5) | 23 (32.9) | 0.013 |
| Impaired balance (–) | 33(46.5) | 47 (67.1) | |
| TUG (seconds) | 13.7 (12.5–16.5) | 13.1 (12.2–14.5) | 0.007 |

Values are n (%) or median (25th and 75th interquartile range). Abbreviations: BBS, Berg Balance Scale; SLS, Single Leg Stance; 5STS, Five Repetition Sit to Stand Test; FSST, Four Step Square Test; TUG, Timed Up and Go Test.

Table 3. Status of impaired balance and falling in the COPD groups

| Variables | COPD Group A and B n = 44 | COPD Group C and D n = 27 | P |
|----------------------|--|--|----------|
| BBS, n (%) | | | |
| Impaired balance (+) | 10 (22.7) | 22 (81.5) | <0.001 |
| Impaired balance (–) | 34 (77.3) | 5 (18.5) | |
| BBS | 50 (47–52) | 48 (43–50) | <0.001 |
| SLS, n (%) | | | |
| Impaired balance (+) | 32 (72.7) | 25 (92.6) | 0.041 |
| Impaired balance (–) | 12 (27.3) | 2 (7.4) | |
| SLS (seconds) | 22.2 (12–31.8) | 16.3 (10.1–25.8) | <0.001 |
| 5STS, n (%) | | | |
| Impaired balance (+) | 39 (88.6) | 27 (100) | 0.149 |
| Impaired balance (–) | 5 (11.4) | 0 (0) | |
| 5STS (seconds) | 16.2 (14.5–19.1) | 17 (15.2–20.8) | <0.001 |
| FSST, n (%) | | | |
| Impaired balance (+) | 26 (59.1) | 23 (85.2) | 0.021 |
| Impaired balance (–) | 18 (40.9) | 4 (14.8) | |
| FSST (seconds) | 15.8 (12.8–17.1) | 16 (13.6–19) | <0.001 |
| TUG (n, %) | | | |
| Impaired balance (+) | 14 (31.8) | 24 (88.9) | <0.001 |
| Impaired balance (–) | 30 (68.2) | 3 (11.1) | |
| TUG (seconds) | 13.1 (12–14.8) | 13.2 (11.7–16.1) | <0.001 |
| Fall history, n (%) | 6 (13.6) | 18 (66.7) | <0.001 |

Values are n (%) or median (25th and 75th interquartile range). Abbreviations: BBS, Berg Balance Scale; SLS, Single Leg Stance; 5STS, Five Repetition Sit to Stand Test; FSST, Four Step Square Test; TUG, Timed Up and Go Test; COPD, Chronic Obstructive Lung Disease.

Table 4. Correlation analysis between impaired balance and functional parameters

| | BBS | | SLS | | TUG | | 5STS | | FSST | |
|--------------|------------|----------|------------|----------|------------|----------|-------------|----------|-------------|----------|
| | r | P | r | P | r | P | r | P | r | P |
| Age | -0.40 | <0.001 | -0.58 | <0.001 | 0.373 | <0.001 | 0.349 | <0.001 | 0.513 | <0.001 |
| | 2 | | 0 | | | | | | | |
| FVC | 0.468 | <0.001 | 0.450 | <0.001 | -0.41 | <0.001 | -0.58 | <0.001 | -0.40 | <0.001 |
| (L) | | | | | 7 | | 2 | | 8 | |
| FVC | 0.398 | <0.001 | -0.32 | <0.001 | -0.36 | <0.001 | -0.57 | <0.001 | -0.33 | <0.001 |
| (%) | | | 9 | | 1 | | 0 | | 6 | |
| FEV1 | 0.459 | <0.001 | 0.507 | <0.001 | -0.43 | <0.001 | -0.67 | <0.001 | -0.42 | <0.001 |
| (L) | | | | | 2 | | 4 | | 6 | |
| FEV1 | 0.368 | <0.001 | 0.393 | <0.001 | -0.36 | <0.001 | -0.62 | <0.001 | -0.34 | <0.001 |
| (%) | | | | | 0 | | 7 | | 4 | |
| FEV1/ FVC | 0.346 | <0.001 | 0.427 | <0.001 | -0.34 | <0.001 | -0.65 | <0.001 | -0.36 | <0.001 |
| | | | | | 9 | | 1 | | 3 | |
| 6MWT | 0.415 | <0.001 | 0.385 | <0.001 | -0.36 | <0.001 | -0.57 | <0.001 | -0.39 | <0.001 |
| (m) | | | | | 3 | | 4 | | 4 | |
| CAT | -0.40 | <0.001 | -0.41 | <0.001 | 0.372 | <0.001 | 0.598 | <0.001 | 0.371 | <0.001 |
| | 4 | | 1 | | | | | | | |
| mMRC | -0.43 | <0.001 | -0.41 | <0.001 | 0.375 | <0.001 | 0.630 | <0.001 | 0.379 | <0.001 |
| | 5 | | 7 | | | | | | | |
| BODE | -0.54 | <0.001 | -0.47 | <0.001 | 0.485 | <0.001 | 0.689 | <0.001 | 0.452 | <0.001 |
| | 9 | | 0 | | | | | | | |

Abbreviations: FVC, forced vital capacity; % pred., percent predicted; FEV1, forced expiratory volume in 1 s; 6MWT, 6-min walk-test; CAT, COPD assessment test; Mmrc, Modified Medical British Research Council dyspnea questionnaire; BODE, BMI (B), airflow obstruction (O), dyspnea (D) and exercise capacity (E); BBS, Berg Balance Scale; SLS, Single Leg Stance; TUG, Timed Up and Go Test; 5STS, Five Repetition Sit to Stand Test; FSST, Four Step Square Test.