**Supplemental Digital Content 4**

**Table:** Pre-rehabilitation characteristics, presented as mean (standard deviation), of patients with COPD that performed a constant work rate test (CWRT) and had reliable kinetic feature values pre- and post-pulmonary rehabilitation, divided as patients with (responders) and without (non-responders) clinically relevant increase of CWRT endurance time following pulmonary rehabilitation (i.e. >105 s increase).

|  |  |  |  |
| --- | --- | --- | --- |
|  | All patients(n=127) | Responders(n=84) | Non-responders(n=43) |
| **Demographics** |  |  |  |
| Male – female | 73 – 54 | 49 – 35 | 24 – 19 |
| Age (years) | 61 (10) | **60 (10)** | **64 (9)\*** |
| Body Mass Index (kg·m-²) | 26.7 (6.0) | **27.7 (6.4)** | **24.9 (4.6)\*** |
| Fat-free mass index (kg·m-²) | 17.4 (2.5) | 17.7 (2.7) | 17.0 (2.1) |
| **Resting pulmonary function** |  |  |  |
| Forced expiratory volume in 1 second (FEV1; %predicted) | 60 (17) | **63 (17)** | **56 (18)\*** |
| Forced vital capacity (FVC; %predicted) | 107 (17) | 108 (16) | 106 (18) |
| FEV1/FVC (%) | 43 (11) | **45 (11)** | **40 (12)\*** |
| Transfer factor for carbon monoxide (%predicted) | 57 (17) | **59 (17)** | **53 (16)\*** |
| Residual volume (%predicted) | 145 (44) | 142 (42) | 151 (47) |
| Intrathoracic gas volume (%predicted) | 138 (32) | **135 (32)** | **145 (31)\*** |
| Total lung capacity (%predicted) | 116 (17) | 115 (16) | 118 (18) |
| Modified Medical Research Council grading ≥ 2 (% patients) | 65 | 63 | 67 |
| **Resting arterial blood gases** |  |  |  |
| Arterial oxygen saturation (%) # | 94.9 (2.5) | 94.9 (2.5) | 94.7 (2.7) |
| Partial pressure of oxygen (kPa) | 9.68 (1.34) | 9.62 (1.35) | 9.80 (1.32) |
| Partial pressure of carbon dioxide (kPa) | 5.00 (0.56) | 5.00 (0.57) | 5.01 (0.56) |
| pH # | 7.43 (0.03) | 7.43 (0.03) | 7.42 (0.03) |
| **Health and mood status** |  |  |  |
| COPD assessment test score # | 21 (9) | 21 (8) | 22 (11) |
| Hospital Anxiety and Depression Scale - Anxiety score # | 6 (7) | 7 (7) | 6 (7) |
| Hospital Anxiety and Depression Scale - Depression score # | 6 (6) | 7 (6) | 6 (9) |
| **Physical performance** |  |  |  |
| Six minute walking distance (m) | 518 (90) | 522 (88) | 508 (94) |
| Six minute walking distance (%predicted) | 79 (12) | 79 (11) | 79 (15) |
| Peak work rate (W) # | 89 (45) | **91 (50.5)** | **84 (35)\*** |
| Peak work rate (%predicted) | 68 (25) | 70 (25) | 64 (25) |
| Peak oxygen uptake (ml·min-1)  | 1288 (415) | **1361 (430)** | **1143 (343)\*\*** |
| Peak oxygen uptake (%predicted) # | 65 (35) | 67 (31) | 59 (27) |
| Isokinetic peak torque (Nm) | 109 (37) | **113 (36)** | **99 (37)\*** |
| Isokinetic peak torque (%predicted) | 74 (18) | 75 (17) | 71 (20) |
| Constant work rate test – Endurance time (s) # | 311 (178) | **337 (183)** | **295 (191)\*** |
| Constant work rate test – Borg dyspnoea score at exercise cessation # | 8 (3) | 8 (2) | 8 (3) |
| Constant work rate test – Borg fatigue score at exercise cessation # | 7 (4) | 7 (5) | 7 (5) |

Values in bold indicate significant differences between responders and non-responders (\*: p<0.05; \*\*: p<0.005).

# Variables are presented as median (interquartile range).

**Table:** Changes in physical performance and constant work rate test (CWRT) isotime values following pulmonary rehabilitation (PR) for patients with reliable kinetic feature values (n=127), presented as mean (standard deviation).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Responders:** **Pre-PR** | **Responders:** **Post-PR** | **Pre-post difference****(P-value)** | **Non-responders:****Pre-PR** | **Non-responders:****Post-PR** | **Pre-post difference****(P-value)** |
| **Health and mood status** |  |  |  |  |  |  |
| COPD assessment test score # | 21 (8) | 18 (10) | **< 0.0001** | 21 (11) | 18 (11) | **0.0005** |
| Hospital Anxiety and Depression Scale - Anxiety score # | 7 (7) | 5 (5) | **< 0.0001** | 6 (7) | 4 (4) | **0.03** |
| Hospital Anxiety and Depression Scale - Depression score # | 7 (6) | 4 (6) | **< 0.0001** | 6 (9) | 3 (5) | **0.03** |
| **Physical performance** |  |  |  |  |  |  |
| Six minute walking distance (m) | 522 (88) | 562 (90) | **< 0.0001** | 508 (94) | 515 (87) | 0.41 |
| Isokinetic peak torque (Nm) | 113 (36) | 128 (41) | **< 0.0001** | 99 (37) | 107 (39) | **< 0.0001** |
| CWRT endurance time (s) # | 337 (183) | 952 (591) | **< 0.0001** | 295 (191) | 309 (164) | 0.31 |
| **CWRT isotime value** |  |  |  |  |  |  |
| Oxygen uptake (ml·min-1) | 1231 (323) | 1218 (335) | 0.32 | 1070 (260) | 1080 (269) | 0.54 |
| Carbon dioxide output (ml·min-1) | 1326 (397) | 1217 (365) | **< 0.0001** |  1126 (287) | 1110 (313) | 0.47 |
| Minute ventilation (L·min-1) | 48.0 (11.8) | 42.7 (10.7) | **< 0.0001** | 44.5 (11.5) | 43.8 (11.8) | 0.47 |
| Minute ventilation·Carbon dioxide output-1 (L·L-1) | 37.2 (7.0) | 35.9 (6.1) | **< 0.001** | 40.0 (6.1) | 39.9 (5.6) | 0.88 |
| Breathing frequency (breaths·min-1) | 29.0 (5.8) | 25.5 (5.5) | **< 0.0001** | 29.6 (5.9) | 29.0 (6.9) | 0.34 |
| Tidal volume (L·breath-1) | 1.65 (0.46) | 1.68 (0.47) | 0.22 | 1.48 (0.41) | 1.52 (0.48) | 0.29 |
| Heart rate (bpm) | 125 (18) | 113 (16) | **< 0.0001** | 119 (17) | 114 (19) | **0.001** |
| Oxygen pulse (ml·beat-1) | 10.0 (2.5) | 10.9 (2.8) | **< 0.0001** | 9.1 (2.3) | 9.6 (2.5) | **0.001** |

Patients are classified as responders (n=84) and non-responders (n=43). Displayed p-values indicate whether there were significant differences between pre- and post-PR values for responders (third column) and non-responders (sixth column).

# Variables are presented as median (interquartile range).