**Supplementary Materials**

**Mini Nutritional Assessment questionnaire**

|  |  |
| --- | --- |
| A. Has food intake declined over the past 3 months due to loss of appetite, digestive problems, and chewing or swallowing difficulties?  0 = Severe decrease in food intake  1 = Moderate decrease in food intake  2 = No decrease in food intake | J. How many full meals does the patient eat daily?  0 = One meal  1 = Two meals  2 = Three meals |
| B. Weight loss during the last 3 months  0 = Weight loss >3 kg (6.6 lbs)  1 = Does not know  2 = Weight loss between 1 kg and 3 kg (2.2 lbs and 6.6 lbs)  3 = No weight loss | K. Consumption records for protein intake  • At least one serving of dairy products (milk, cheese, or yoghurt) per day  • Two or more servings of legumes or eggs per week  • Meat, fish, or poultry every day  0.0 = if 0 or 1 yes  0.5 = if 2 yes  1.0 = if 3 yes |
| C. Mobility  0 = Confined to the bed or chair. bound  1 = Able to get out of bed/chair but does not go out  2 = Able to go out | L. Consumes two or more servings of fruit or vegetables per day?  0 = No  1 = Yes |
| D. Has suffered psychological stress or acute disease in the past 3 months?  0 = Yes  2 = No | M. How much fluid (water, juice, coffee, tea, milk, etc.) is consumed per day?  0.0 = <3 cups  0.5 = 3–5 cups  1.0 = >5 cups |
| E. Neuropsychological problems  0 = Severe dementia or depression  1 = Mild dementia  2 = No psychological problem | N. Mode of feeding  0 = Unable to eat without assistance  1 = Self-fed with some difficulty  2 = Self-fed without any problem |
| F. BMI(kg/m2)  0 = BMI <19  1 = BMI 19 to <21  2 = BMI 21 to <23  3 = BMI ≥23 | O. Self-view of nutritional status  0 = Views self as being malnourished  1 = Uncertain about own nutritional state  2 = Views self as having no nutritional problem |
| G. Lives independently (not in nursing home or hospital)  1 = Yes  0 = No | P. In comparison with other people of the same age, how does the patient consider his/her health status?  0.0 = Not as good  0.5 = Uncertainly  1.0 = As good  2.0 = Better |
| H. Takes >3 prescription drugs per day  0 = Yes  1 = No | Q. Mid-arm circumference (cm)  0.0 = Mid-arm circumference <21  0.5 = Mid-arm circumference 21–22  1.0 = Mid-arm circumference >22 |
| I. Pressure sores or skin ulcers  0 = Yes  1 = No | R. Calf circumference (cm)  0 = CC <31  1 = CC ≥31 |

**Supplementary Table 1: Demographic and clinical characteristics of COPD patients with or without readmission within 6 months after discharge from hospital.**

| **Items** | **All patients**  **(*n*=302)** | **Readmission**  **(*n*=54)** | **Non-readmission**  **(*n*=248)** | ***t/χ2*/*Z* value** | ***P*-value** |
| --- | --- | --- | --- | --- | --- |
| Baseline characteristics |  |  |  |  |  |
| Age (years) | 77 ± 7.6 | 79.7 ± 7.9 | 76.4 ± 7.4 | 2.99\* | 0.003 |
| Male, *n* (%) | 166 (55.0) | 28 (51.9) | 138 (55.6) | 0.26† | 0.612 |
| Smoking status, *n* (%) |  |  |  | 4.21† | 0.122 |
| Current smoker | 28 (9.3) | 8 (14.8) | 20 (8.1) |  |  |
| Former smoker | 112 (37.1) | 23 (42.6) | 89 (35.9) |  |  |
| Never smoker | 162 (53.6) | 23 (42.6) | 139 (56.0) |  |  |
| History of tuberculosis | 47 (15.6) | 13 (24.1) | 34 (13.7) | 3.63† | 0.057 |
| History of bronchiectasis | 76 (25.2) | 18 (33.3) | 58 (23.4) | 2.33† | 0.127 |
| Chronic cough during childhood | 57 (18.9) | 11 (20.4) | 46 (18.6) | 0.10† | 0.757 |
| Body mass index (kg/m2) | 24.3 ± 3.4 | 23.0 ± 3.2 | 24.6 ± 3.4 | –3.14\* | 0.002 |
| Muscle-related variables |  |  |  |  |  |
| Upper-arm circumference (cm) | 23.7 ± 4.9 | 19.8 ± 4.5 | 24.5 ± 4.6 | –6.21\* | <0.001 |
| Calf circumference (cm) | 30.5 ± 5.6 | 26.8 ± 4.3 | 31.4 ± 5.5 | –5.06\* | <0.001 |
| Skeletal muscle mass index (kg/m2) | 6.4 ± 1.2 | 5.6 ± 1.2 | 6.6 ± 1.1 | –5.49\* | <0.001 |
| Male | 7.0 ± 1.2 | 5.9 ± 1.3 | 7.2 ± 1.0 | –6.21\* | <0.001 |
| Female | 5.7 ± 0.8 | 5.4 ± 1.0 | 5.8 ± 1.3 | –2.36\* | 0.020 |
| Handgrip strength (kg) | 26 (21.0–33.0) | 22 (15.3–31.2) | 27 (22.0–33.2) | –3.41‡ | <0.001 |
| Gait speed (m/s) | 0.8 (0.7–1.2) | 0.6 (0.4–0.8) | 1.0 (0.8–1.5) | 1.26‡ | <0.001 |
| Sarcopenia | 107 (35.4) | 36 (66.7) | 71 (28.6) | 28.00† | <0.001 |
| Pulmonary function test |  |  |  |  |  |
| FEV1% | 56.0 (45.0-69.8) | 52.7 (44.0–62.7) | 56.0 (45.7–70.2) | –1.88‡ | 0.042 |
| FVC (L) | 1.1 ± 0.3 | 1.2 ± 0.3 | 1.1 ± 0.4 | 0.14\* | 0.580 |
| FEV1/FVC ratio (%) | 60.3 ± 9.5 | 57.0 ± 10.4 | 61.3 ± 9.1 | –2.90\* | 0.004 |
| Severity of airflow limitation |  |  |  | 3.58† | 0.311 |
| Mild GOLD I | 8 (2.6) | 2 (3.7) | 6 (2.4) |  |  |
| Moderate GOLD II | 198 (65.6) | 31 (57.4) | 167 (67.4) |  |  |
| Severe GOLD III | 81 (26.8) | 16 (29.6) | 65 (26.2) |  |  |
| Very severe GOLD IV | 15 (5.0) | 5 (9.3) | 10 (4.0) |  |  |
| COPD severity based on GOLD | | |  | 1.66† | 0.600 |
| Group A | 9 (3.0) | 1 (1.9) | 8 (3.2) |  |  |
| Group B | 125 (41.4) | 19 (35.2) | 106 (42.7) |  |  |
| Group C | 72 (23.8) | 13 (24.0) | 59 (23.8) |  |  |
| Group D | 96 (31.8) | 21 (38.9) | 75 (30.3) |  |  |
| COPD symptom scale |  |  |  |  |  |
| CAT | 16(10–22) | 18(11.8–22) | 15(10–22) | –1.36‡ | 0.001 |
| mMRC scale | 3 (2–3) | 3 (2–3) | 2 (2–3) | –2.25‡ | 0.024 |
| Nutritional status by MNA score |  |  |  | 23.40† | <0.001 |
| Normal | 187 (61.9) | 20 (37.0) | 167 (67.3) |  |  |
| At risk of malnutrition | 84 (27.8) | 24 (44.5) | 60 (24.2) |  |  |
| Malnutrition | 31 (10.3) | 10 (18.5) | 21 (8.5) |  |  |
| Laboratory data |  |  |  |  |  |
| Albumin (g/L) | 37.5 ± 5.6 | 36.1 ± 5.8 | 37.7 ± 5.5 | –1.88\* | 0.061 |
| Hemoglobin (g/L) | 123.7 ± 17.7 | 118.9 ± 19.6 | 124.8 ± 17.1 | –1.78\* | 0.028 |
| Drug usage |  |  |  | 1.54† | 0.109 |
| ICS + LABA + LAMA | 76 (25.2) | 8 (14.8) | 68 (27.4) |  |  |
| ICS + LABA or ICS + LAMA | 66 (21.8) | 10 (18.5) | 56 (22.6) |  |  |
| LABA + LAMA | 67 (22.2) | 15 (27.8) | 52 (21.0) |  |  |
| LAMA or LABA | 60 (19.9) | 11 (20.4) | 49 (19.7) |  |  |
| Non-used regularly | 33 (10.9) | 10 (18.5) | 23 (9.3) |  |  |
| Comorbidity |  |  |  |  |  |
| Coronary artery diseases | 121 (40.1) | 26 (48.1) | 95 (38.3) | 1.79† | 0.119 |
| Moderate or severe renal diseases | 20 (6.6) | 6 (11.1) | 14 (5.6) | 1.35† | 0.251 |
| Cerebrovascular diseases | 40 (13.2) | 12 (22.2) | 28 (11.3) | 4.61† | 0.033 |
| Diabetes | 46 (15.2) | 14 (25.9) | 32 (12.9) | 5.82† | 0.017 |
| Tumor | 34 (11.3) | 10 (18.5) | 24 (9.7) | 3.47† | 0.119 |
| Congestive heart failure | 45 (14.9) | 10 (18.5) | 35 (14.1) | 0.68† | 0.527 |
| Rheumatologic | 3 (1.0) | 3 (5.6) | 0 (0) | – | 0.005 |
| Charlson Comorbidity Index | 2 (1–3) | 3 (2–4) | 2 (1–3) | –3.74‡ | <0.001 |
| Length of admission (days) | 11 (8–13) | 11 (7–13) | 11 (9-14) | –1.22‡ | 0.274 |
| Time to readmission (days) |  | 101.5 (58.75–147.0) |  |  |  |

Data are expressed as the mean ± standard deviation, the median (25th and 75th percentiles) or number (percentage). \**t* values; †*χ* 2 values; ‡*Z* values. CAT: COPD assessment test; COPD: Chronic obstructive pulmonary disease; FEV1: Forced expiratory volume in one second; FVC: Forced vital capacity; GOLD: Global Initiative for Chronic Obstructive Lung Disease; GS: Gait speed; ICS: Inhaled corticosteroids; LABA: Long-acting beta-agonist; LAMA: Long-acting muscarinic antagonist; mMRC: Modified Medical Research Council; MNA: Mini Nutritional Assessment; –: Not available