**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 intake1 = Moderate decrease in food intake2 = No decrease in food intake | J. How many full meals does the patient eat daily?0 = One meal1 = Two meals2 = Three meals |
| B. Weight loss during the last 3 months0 = Weight loss >3 kg (6.6 lbs)1 = Does not know2 = 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 day0.0 = if 0 or 1 yes0.5 = if 2 yes1.0 = if 3 yes |
| C. Mobility0 = Confined to the bed or chair. bound1 = Able to get out of bed/chair but does not go out2 = Able to go out | L. Consumes two or more servings of fruit or vegetables per day?0 = No1 = Yes |
| D. Has suffered psychological stress or acute disease in the past 3 months?0 = Yes2 = No | M. How much fluid (water, juice, coffee, tea, milk, etc.) is consumed per day?0.0 = <3 cups0.5 = 3–5 cups1.0 = >5 cups |
| E. Neuropsychological problems0 = Severe dementia or depression1 = Mild dementia2 = No psychological problem | N. Mode of feeding0 = Unable to eat without assistance1 = Self-fed with some difficulty2 = Self-fed without any problem |
| F. BMI(kg/m2)0 = BMI <191 = BMI 19 to <212 = BMI 21 to <233 = BMI ≥23 | O. Self-view of nutritional status0 = Views self as being malnourished1 = Uncertain about own nutritional state2 = Views self as having no nutritional problem |
| G. Lives independently (not in nursing home or hospital)1 = Yes0 = No | P. In comparison with other people of the same age, how does the patient consider his/her health status?0.0 = Not as good0.5 = Uncertainly1.0 = As good2.0 = Better |
| H. Takes >3 prescription drugs per day 0 = Yes1 = No | Q. Mid-arm circumference (cm)0.0 = Mid-arm circumference <210.5 = Mid-arm circumference 21–221.0 = Mid-arm circumference >22 |
| I. Pressure sores or skin ulcers0 = Yes1 = No | R. Calf circumference (cm)0 = CC <311 = 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