Online Supplement

Determinants for changing the treatment of COPD: a regression analysis from a clinical audit

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Table 1S. Bivariate analysis of factors associated with a step-up of treatment.

	No step-up (n = 466)	Step-up (n = 99)	P-Value*
Monographic COPD clinic	187 (40.1)	42 (42.4)	NS
Outpatient clinic located within the hospital	455 (97.6)	96 (97.0)	NS
Male gender	69 (14.8)	16 (16.2)	NS
Age (years)	68.4 (9.5)	69.4 (10.4)	NS
Rural area	135 (20.9)	28 (28.3)	NS
Current smoker	104 (23.4)	27 (28.7)	NS
Tobacco history (pack-year)	56.0 (32.1)	51.1 (25.3)	NS
Acute myocardial infraction	43 (9.2)	15 (15.2)	0.099
Charlson	2.1 (1.6)	2.2 (1.3)	NS
GesEPOC phenotype A	222 (47.6)	37 (37.4)	NS
GesEPOC phenotype B	47 (10.1)	12 (12.1)	NS
GesEPOC phenotype C	39 (8.4)	7 (7.1)	NS
GesEPOC phenotype D	68 (14.6)	17 (17.2)	NS
GOLD type A	89 (19.1)	20 (20.2)	NS
GOLD type B	45 (9.7)	14 (14.1)	NS
GOLD type C	81 (17.4)	16 (16.2)	NS
GOLD type D	88 (18.9)	20 (20.2)	NS
Dyspnea (mMRC)	1.6 (1.0)	1.8 (0.8)	0.021
Chronic bronchitis	215 (46.1)	61 (61.6)	0.006
Purulent sputum	33 (7.1)	9 (9.1)	NS
Asthma-like symptoms	77 (16.5)	21 (21.2)	NS
Exacerbations previous year	0.8 (1.3)	1.3 (1.6)	0.004
Hospitalizations previous year	0.2 (0.5)	0.2 (0.6)	NS

	No step-up (n = 466)	Step-up (n = 99)	P-Value*
Performs exercise	116 (24.9)	23 (23.2)	NS
Influenza vaccine	159 (34.1)	39 (39.4)	NS
Pneumococcal vaccine	45 (9.7)	12 (12.1)	NS
Receiving non-combined LAMA	408 (87.6)	60 (61.2)	< 0.001
Receiving non-combined tiotropium	330 (70.8)	45 (45.9)	< 0.001
Receiving non-combined aclidinium	60 (12.9)	8 (8.2)	NS
Receiving non-combined glycopyrronium	24 (5.2)	9 (9.3)	NS
Receiving non-combined LABA	99 (21.2)	22 (22.4)	NS
Receiving non-combined salmeterol	1 (0.2)	1 (1.0)	NS
Receiving non-combined formoterol	3 (0.6)	0 (0)	NS
Receiving non-combined indacaterol	95 (20.4)	22 (22.4)	NS
Receiving non-combined LABA + LAMA	91 (19.5)	16 (16.2)	NS
Receiving non-combined ICS	28 (6.0)	13 (13.1)	0.019
Receiving combined ICS-LABA	315 (67.6)	42 (42.4)	< 0.001
Receiving combined salmeterol-fluticasone	191 (41.0)	27 (27.3)	0.012
Receiving combined formoterol-budesonide	100 (21.5)	11 (11.1)	0.018
Receiving combined formoterol-beclomethasone	25 (5.4)	4 (4.0)	NS
Receiving any form of ICS	341 (73.2)	53 (53.5)	< 0.001
Receiving low dose of ICS	36 (7.7)	8 (8.1)	NS
Receiving medium dose of ICS	164 (35.2)	19 (19.2)	0.094
Receiving high dose of ICS	119 (25.5)	23 (23.2)	NS
Receiving triple therapy with LAMA+FDC	273 (58.6)	26 (26.3)	< 0.001
Receiving roflumilast	55 (11.8)	8 (8.2)	NS
Receiving mucolytics	42 (9.0)	3 (3.1)	0.062
Receiving antibiotics	13 (2.8)	0 (0)	NS

	No step-up (n = 466)	Step-up (n = 99)	P-Value*
Receiving oral methylxanthines	21 (4.5)	3 (3.0)	NS
Receiving long-term oxygen therapy	88 (18.9)	18 (18.2)	NS
Receiving home mechanical ventilation	23 (4.9)	3 (3.0)	NS
Receiving nebulized home therapy	17 (3.6)	4 (4.0)	NS
Treatment adherence evaluation	255 (54.7)	65 (65.7)	0.057
Inhaler device satisfaction evaluation	81 (17.4)	20 (20.2)	NS
Adverse effects recorded	110 (23.6)	30 (30.3)	NS
FVC (%)	74.9 (21.1)	76.5 (19.8)	NS
FEV_1 (%)	52.3 (20.1)	53.2 (18.0)	NS
FEV_1 increase after the bronchodilator test (%)	7.2 (9.8)	9.2 (13.7)	NS

Average value expressed as mean (standard deviation) or absolute (relative) frequencies depending on the nature of the variable.

* Calculated between groups using an unpaired Student t-test or a Chi-square test, depending on the nature of the variable.

LAMA: long-acting muscarinic antagonists. LABA: long-acting β_2 agonist. ICS: inhaled corticosteroids. FDC: fixed-dose combinations of an ICS and a LABA. FVC: forced vital capacity. FEV_1: forced expiratory volume in one second.

Table 2S. Factors associated with a step-down of treatment.

	No step-down (n = 510)	Step-down (n = 55)	P-Value*
Monographic COPD clinic	205 (40.2)	24 (43.6)	NS
Outpatient clinic located within the hospital	497 (97.5)	54 (98.2)	NS
Male gender	81 (15.9)	4 (7.3)	NS
Age (years)	68.7 (9.8)	68.0 (8.3)	NS
Rural area	363 (71.2)	39 (70.9)	NS
Current smoker	133 (26.7)	9 (16.4)	NS
Tobacco history (pack-year)	54.0 (30.0)	65.7 (38.3)	0.011
Depression	47 (9.2)	9 (16.4)	0.098
Charlson	2.1 (1.5)	1.9 (1.5)	NS
GesEPOC phenotype A	231 (45.3)	28 (50.9)	0.020
GesEPOC phenotype B	57 (11.2)	2 (3.6)	0.049
GesEPOC phenotype C	44 (8.6)	2 (3.6)	0.082
GesEPOC phenotype D	79 (15.5)	6 (10.9)	NS
GOLD type A	93 (18.2)	16 (29.1)	0.031
GOLD type B	55 (10.8)	4 (7.3)	NS
GOLD type C	88 (17.3)	9 (16.4)	NS
GOLD type D	104 (20.4)	4 (7.3)	0.062
Dyspnea (mMRC)	1.7 (1.0)	1.4 (0.9)	NS
Chronic bronchitis	253 (49.6)	23 (41.8)	NS
Purulent sputum	38 (7.5)	4 (7.3)	NS
Asthma-like symptoms	95 (18.6)	3 (5.5)	0.036
Exacerbations previous year	0.9 (1.3)	0.8 (1.5)	NS
Hospitalizations previous year	0.2 (0.6)	0.2 (0.6)	NS

	No step-down (n = 510)	Step-down (n = 55)	P-Value*
Performs exercise	125 (38.0)	14 (40.0)	NS
Influenza vaccine	180 (35.3)	18 (32.7)	NS
Pneumococcal vaccine	52 (10.2)	5 (9.1)	NS
Receiving non-combined LAMA	420 (82.5)	48 (87.3)	NS
Receiving non-combined tiotropium	335 (65.8)	40 (72.7)	NS
Receiving non-combined aclidinium	62 (12.2)	6 (10.9)	NS
Receiving non-combined glycopyrronium	31 (6.1)	2 (3.6)	NS
Receiving non-combined LABA	107 (21.0)	14 (25.5)	NS
Receiving non-combined salmeterol	1 (0.2)	1 (1.8)	NS
Receiving non-combined formoterol	2 (0.4)	1 (1.8)	NS
Receiving non-combined indacaterol	105 (20.7)	12 (21.8)	NS
Receiving non-combined LABA + LAMA	94 (18.4)	13 (23.6)	NS
Receiving non-combined ICS	35 (6.9)	6 (10.9)	NS
Receiving combined ICS-LABA	314 (61.6)	43 (78.2)	0.018
Receiving combined salmeterol-fluticasone	188 (36.9)	30 (54.5)	0.013
Receiving combined formoterol-budesonide	101 (19.8)	10 (18.2)	NS
Receiving combined formoterol-beclomethasone	26 (5.1)	3 (5.5)	NS
Receiving any form of ICS	345 (67.6)	49 (89.1)	0.001
Receiving low dose of ICS	39 (7.6)	5 (9.1)	NS
Receiving medium dose of ICS	153 (30.0)	30 (54.5)	0.027
Receiving high dose of ICS	131 (25.7)	11 (20.0)	0.035
Receiving triple therapy with LAMA+FDC	263 (51.6)	36 (65.5)	0.064
Receiving roflumilast	57 (11.2)	6 (10.9)	NS
Receiving mucolytics	37 (7.3)	8 (14.5)	0.068
Receiving antibiotics	9 (1.8)	4 (7.3)	0.030

	No step-down (n = 510)	Step-down (n = 55)	P-Value*
Receiving oral methylxanthines	16 (3.1)	8 (14.5)	0.001
Receiving long-term oxygen therapy	103 (20.2)	3 (5.5)	0.006
Receiving home mechanical ventilation	26 (5.1)	0 (0)	0.097
Receiving nebulized home therapy	19 (3.7)	2 (3.6)	NS
Treatment adherence evaluation	284 (55.7)	36 (65.5)	NS
Inhaler device satisfaction evaluation	88 (17.3)	13 (23.6)	NS
Adverse effects recorded	123 (24.1)	17 (30.9)	NS
FVC (%)	74.9 (20.9)	78.2 (20.7)	NS
FEV1 (%)	51.7 (19.2)	60.2 (22.3)	0.057
FEV1 increase after the bronchodilator test (%)	7.7 (11.1)	7.4 (7.5)	NS

Average value expressed as mean (standard deviation) or absolute (relative) frequencies depending on the nature of the variable.

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Table 3S. Bivariate analysis indicating factors associated with discontinuing inhaled steroids.

	No ICS withdrawal (n = 355)	ICS withdrawal (n = 39)	
Monographic COPD clinic	146 (41.1)	15 (38.9)	NS
Outpatient clinic located within the hospital	348 (98.0)	38 (974)	NS
Male gender	301 (84.8)	32 (82.1)	NS
Age (years)	69.2 (9.7)	67.3 (8.6)	NS
Rural area	117 (33.0)	11 (28.2)	NS
Current smoker	82 (23.1)	9 (23.1)	NS
Tobacco history (pack-year)	55.1 (31.8)	61.6 (41.3)	NS
Diabetes	78 (22.0)	3 (7.7)	0.037
Depression	33 (9.3)	8 (20.5)	0.047
Anxiety	33 (9.3)	7 (17.9)	0.096
Charlson	2.2 (1.6)	2.0 (1.7)	NS
GesEPOC phenotype A	132 (37.2)	21 (53.8)	0.013
GesEPOC phenotype B	49 (13.8)	2 (5.1)	NS
GesEPOC phenotype C	31 (8.7)	1 (2.6)	NS
GesEPOC phenotype D	70 (19.7)	4 (10.3)	NS
GOLD type A	36 (54.4)	11 (28.2)	< 0.001
GOLD type B	37 (10.4)	2 (5.1)	NS
GOLD type C	67 (18.9)	6 (15.4)	NS
GOLD type D	89 (25.1)	3 (7.7)	0.020
Dyspnea (mMRC)	1.8 (0.9)	1.4 (0.9)	0.032
Chronic bronchitis	186 (52.4)	16 (41.0)	NS

	No ICS withdrawal (n = 355)	ICS withdrawal (n = 39)	
Purulent sputum	36 (10.1)	1 (2.6)	NS
Asthma-like symptoms	75 (21.1)	3 (7.7)	0.011
Exacerbations previous year	1.1 (1.4)	0.6 (0.8)	0.035
Hospitalizations previous year	0.3 (0.6)	0.3 (0.7)	NS
Performs exercise	83 (23.4)	10 (25.6)	NS
Influenza vaccine	137 (38.6)	15 (38.5)	NS
Pneumococcal vaccine	44 (12.4)	2 (5.1)	0.060
Receiving non-combined LAMA	301 (84.8)	28 (71.8)	0.065
Receiving non-combined Tiotropium	250 (70.4)	23 (59.0)	NS
Receiving non-combined aclidinium	40 (11.3)	5 (12.8)	NS
Receiving non-combined glycopyrronium	14 (3.9)	0 (0)	NS
Receiving non-combined LABA	25 (7.0)	7 (17.9)	0.028
Receiving non-combined salmeterol	2 (0.6)	0 (0)	NS
Receiving non-combined formoterol	0 (0)	1 (2.6)	0.099
Receiving non-combined indacaterol	24 (6.8)	6 (15.4)	NS
Receiving non-combined LABA + LAMA	20 (5.6)	6 (15.4)	0.033
Receiving non-combined ICS	35 (9.9)	6 (15.4)	NS
Receiving combined ICS-LABA	324 (91.3)	33 (84.6)	NS
Receiving combined salmeterol-fluticasone	193 (54.4)	25 (64.1)	NS
Receiving combined formoterol-budesonide	105 (29.6)	6 (15.4)	0.063
Receiving combined formoterol-beclomethasone	27 (7.6)	2 (5.1)	NS
Receiving low dose of ICS	38 (10.7)	6 (15.4)	NS
Receiving medium dose of ICS	161 (45.4)	22 (56.4)	NS
Receiving high dose of ICS	133 (37.5)	9 (23.1)	NS

	No ICS withdrawal (n = 355)	ICS withdrawal (n = 39)	
Receiving triple therapy with LAMA+FDC	277 (78.0)	22 (56.4)	0.005
Receiving roflumilast	51 (14.4)	2 (5.1)	NS
Receiving mucolytics	30 (8.5)	6 (15.4)	NS
Receiving antibiotics	10 (2.8)	1 (2.6)	NS
Receiving oral methylxanthines	18 (5.1)	1 (2.6)	NS
Receiving long-term oxygen therapy	77 (21.7)	1 (2.6)	0.002
Receiving home mechanical ventilation	21 (5.9)	0 (0)	NS
Receiving nebulized home therapy	17 (4.8)	1 (2.6)	NS
Treatment adherence evaluation	200 (56.3)	24 (61.5)	NS
Inhaler device satisfaction evaluation	62 (17.5)	6 (15.4)	NS
Adverse effects recorded	97 (27.3)	9 (23.1)	NS
FVC (%)	71.8 (19.0)	78.0 (21.2)	NS
FEV1 (%)	47.6 (16.9)	59.8 (22.2)	0.016
FEV1 increase after the bronchodilator test (%)	7.8 (10.2)	6.0 (6.7)	NS

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