

ONLINE MATERIAL

Manuscript: Association between physical activity and risk of hospitalisation in bronchiectasis

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Online Table S1. Crude and adjusted associations between level of physical activity in steps per day and sedentary time with bronchiectasis hospitalisations.

	N	Crude OR (95% CI)	p value	Adjusted OR (95% CI) ^a	p value	Adjusted OR (95% CI) ^b	p value	Adjusted OR (95% CI) ^c	p value	Adjusted OR (95% CI) ^d	p value
Steps per day						-	-			-	-
High physical activity (≥6,290 steps per day)	43	1.00		1.00		-	-	1.00		-	-
Low physical activity (<6,290 steps per day)	21	4.62 (1.36 to 15.68)	0.014	4.20 (0.82 to 21.47)	0.085	-	-	3.37 (0.85 to 13.39)	0.085	-	-
Sedentary time				-	-			-	-		
Sedentary (≥7.8h)	24	7.62 (2.06 to 28.18)	0.002	-	-	5.91 (1.26 to 27.81)	0.024	-	-	5.34 (1.29 to 22.46)	0.020
No sedentary (<7.8h)	40	1.00		-	-	1.00		-	-	1.00	
Age (+1 year)	64	1.01 (0.97 to 1.05)	0.646	0.99 (0.94 to 1.04)	0.681	0.99 (0.94 to 1.05)	0.804	-	-	-	-
Gender											
Male	21	1.00		1.00		1.00		1.00		1.00	
Female	43	0.66 (0.20 to 2.19)	0.500	0.55 (0.13 to 2.42)	0.432	0.83 (0.19 to 3.68)	0.802	0.76 (0.18 to 3.37)	0.715	1.14 (0.27 to 4.77)	0.861
<i>Pseudomonas aeruginosa</i>								-	-	-	-
No	45	1.00		1.00		1.00		-	-	-	-
Yes	19	8.89 (2.44 to 32.43)	0.001	5.83 (1.35 to 25.16)	0.018	6.82 (1.56 to 29.94)	0.011	-	-	-	-
Hospitalisations 12 months prior to the study								-	-	-	-
No	51	1.00		1.00		1.00		-	-	-	-
Yes	13	6.27 (1.66 to 23.62)	0.007	6.70 (1.38 to 32.65)	0.018	5.65 (1.12 to 28.44)	0.036	-	-	-	-
MRC Dyspnoea Scale			0.347	-	-	-	-	-	-	-	-
1	12	1.00		-	-	-	-	-	-	-	-
2	39	2.41 (0.27 to 21.81)	0.435	-	-	-	-	-	-	-	3
3	10	7.33 (0.66 to 81.36)	0.105	-	-	-	-	-	-	-	-

4	3	-	-	-	-	-	-	-	-	-	-
FEV₁ (+1 %)	64	0.97 (0.94 to 1.00)	0.034	-	-	-	-	-	-	-	-
BSI stage			0.004	-	-	-	-		0.022		0.035
Mild	23	1.00		-	-	-	-	1.00		1.00	
Moderate	22	1.66 (0.25 to 11.02)	0.601	-	-	-	-	1.46 (0.20 to 10.43)	0.707	1.99 (0.27 to 14.5)	0.495
Severe	19	11.67 (2.12 to 64.33)	0.005	-	-	-	-	8.35 (1.43 to 48.71)	0.018	8.79 (1.47 to 52.5)	0.017
6MWT (+1 meter)	64	0.99 (0.99 to 1.00)	0.056	-	-	-	-	-	-	-	-

Abbreviations. OR: odds-ratio; CI: confidence interval; h: hours; MRC: medical research council; FEV₁: forced expiratory volume in one second; BSI: bronchiectasis severity index; 6MWT: 6 minutes walking test.

Data are shown as estimated ORs (95% CIs) of the explanatory variables in the low level of physical activity group. The OR represents the odds that low level of physical activity will occur given exposure to the explanatory variable, compared to the odds of the outcome occurring in the absence of that exposure. The P-values are based on the null hypothesis that all ORs relating to an explanatory variable are equal to unity (no effect).

^a Initial multivariable model comprised age, gender, chronic colonisation by *Pseudomonas aeruginosa*, hospitalisations 12 months prior to the study, MRC Dyspnoea Scale, FEV₁ %predicted, BSI stage and 6MWT. Final multivariable model was adjusted for age, gender, chronic colonisation by *Pseudomonas aeruginosa* and hospitalisations 12 months prior to the study. Hosmer–Lemeshow goodness-of-fit test for the multivariable model, p = 0.85. Area under the ROC curve for the multivariable model, AUC = 0.86 (0.76 to 0.97).

^b Initial multivariable model comprised age, gender, chronic colonisation by *Pseudomonas aeruginosa*, hospitalisations 12 months prior to the study, MRC Dyspnoea Scale, FEV₁ %predicted, BSI stage and 6MWT. Final multivariable model was adjusted for age, gender, chronic colonisation by *Pseudomonas aeruginosa* and hospitalisations 12 months prior to the study. Hosmer–Lemeshow goodness-of-fit test for the multivariable model, p = 0.78. Area under the ROC curve for the multivariable model, AUC = 0.87 (0.76 to 0.97).

^c Initial multivariable model comprised gender and BSI stage. Final multivariable model was adjusted for gender and BSI. Hosmer–Lemeshow goodness-of-fit test for the multivariable model, p = 0.986. Area under the ROC curve for the multivariable model, AUC = 0.80 (0.67 to 0.94).

^d Initial multivariable model comprised gender and BSI stage. Final multivariable model was adjusted for gender and BSI. Hosmer–Lemeshow goodness-of-fit test for the multivariable model, p = 0.606. Area under the ROC curve for the multivariable model, AUC = 0.81 (0.67 to 0.95).

Online Table S2. Crude and adjusted associations between level of physical activity in steps per day and sedentary time excluding patients with ≥ 10 pack/year of tobacco.

	N	Crude OR (95% CI)	p value	Adjusted OR (95% CI) ^a	p value	Adjusted OR (95% CI) ^b	p value
Steps per day						-	-
High physical activity ($\geq 6,290$ steps per day)	36	1.00		1.00		-	-
Low physical activity ($< 6,290$ steps per day)	12	4.43 (1.00 to 19.58)	0.050	8.7 (1.16 to 65.01)	0.035	-	-
Sedentary time				-	-		
Sedentary (≥ 7.8 h)	14	5.62 (1.27 to 24.86)	0.023	-	-	5.54 (0.77 to 40.01)	0.089
No sedentary (< 7.8 h)	34	1.00		-	-	1.00	
Age (+1 year)	48	0.983 (0.94 to 1.03)	0.450	0.94 (0.88 to 1.00)	0.056	0.95 (0.88 to 1.02)	0.169
Gender							
Male	15	1.00		1.00		1.00	
Female	33	1.07 (0.24 to 4.90)	0.924	1.34 (0.17 to 10.46)	0.778	1.19 (0.15 to 9.65)	0.870
<i>Pseudomonas aeruginosa</i>				-	-		
No	34	1.00		-	-	1.00	
Yes	14	10.3 (2.13 to 50.26)	0.004	-	-	8.50 (1.14 to 63.39)	0.037
Hospitalisations 12 months prior to the study							
No	37	1.00		1.00		1.00	
Yes	11	9.90 (2.05 to 47.89)	0.004	19.3 (2.39 to 155.6)	0.005	15.93 (1.60 to 158.3)	0.018
FEV₁ (+1 %)	48	0.97 (0.94 to 1.00)	0.217	-	-	-	-
BSI stage			0.071	-	-	-	-
Mild	15	1.00		-	-	-	-
Moderate	19	2.62 (0.24 to 28.19)	0.426	-	-	-	-

Severe	14	10.5 (1.06 to 103.5)	0.044	-	-	-	-
6MWT (+1 meter)	48	0.99 (0.98 to 1.00)	0.336	-	-	-	-

Abbreviations. OR: odds-ratio; CI: confidence interval; h: hours; MRC: medical research council; FEV₁: forced expiratory volume in one second; BSI: bronchiectasis severity index; 6MWT: 6 minutes walking test.

Data are shown as estimated ORs (95% CIs) of the explanatory variables in the low level of physical activity group. The OR represents the odds that low level of physical activity will occur given exposure to the explanatory variable, compared to the odds of the outcome occurring in the absence of that exposure. The P-values are based on the null hypothesis that all ORs relating to an explanatory variable are equal to unity (no effect).

^a Initial multivariable model comprised age, gender, chronic colonisation by *Pseudomonas aeruginosa*, hospitalisations 12 months prior to the study, MRC Dyspnoea Scale, FEV₁ %predicted, BSI stage and 6MWT. Final multivariable model was adjusted for age, gender, chronic colonisation by *Pseudomonas aeruginosa* and hospitalisations 12 months prior to the study. Hosmer–Lemeshow goodness-of-fit test for the multivariable model, $p = 0.76$. Area under the ROC curve for the multivariable model, AUC = 0.87 (0.75 to 0.98).

^b Initial multivariable model comprised age, gender, chronic colonisation by *Pseudomonas aeruginosa*, hospitalisations 12 months prior to the study, MRC Dyspnoea Scale, FEV₁ %predicted, BSI stage and 6MWT. Final multivariable model was adjusted for age, gender, chronic colonisation by *Pseudomonas aeruginosa* and hospitalisations 12 months prior to the study. Hosmer–Lemeshow goodness-of-fit test for the multivariable model, $p = 0.35$. Area under the ROC curve for the multivariable model, AUC = 0.89 (0.78 to 1.00).

Online Table S3. Physical activity baseline characteristics of hospitalised vs. non-hospitalised bronchiectasis patients including weekend data.

	All patients	Hospitalised	Non-hospitalised	p value
	N=64	N=15 (23%)	N=49 (77%)	
Physical Activity				
Light PA, 1.6 - <3.0 MET-min/day	211.4 (75.9)	184.3 (37.0)	220.2 (82.8)	0.110
Moderate PA, 3.0 - <6.0 MET-min/day	112.9 (80)	84.4 (64)	121.6 (82.8)	0.050
Vigorous PA, 6.0 - <8.7 MET-min/day	0.81 (2.17)	0.4 (1.1)	0.9 (2.4)	0.486
MVPA, min/day	113.9 (80.6)	85.1 (64.5)	122.7 (83.5)	0.047
Steps per day	6,933 (3,345)	5,156.11 (3464)	7,477.4 (3,146)	0.019
Sedentary time, hours per day	7.51 (1.77)	8.53 (1.52)	7.21 (1.74)	0.018

Data are presented as n (%), mean (SD) or median (P₂₅;P₇₅). *Data presented as mean (SD), and range.

Abbreviations. BMI: body mass index; MRC: medical research council; COPD: chronic obstructive pulmonary disease; BSI: bronchiectasis severity index; FEV₁: forced expiratory volume in one second; FVC: forced vital capacity; 6MWT: 6 minutes walking test; PA: physical activity; MET: metabolic equivalent tasks; MVPA: moderate-to-vigorous physical activity.

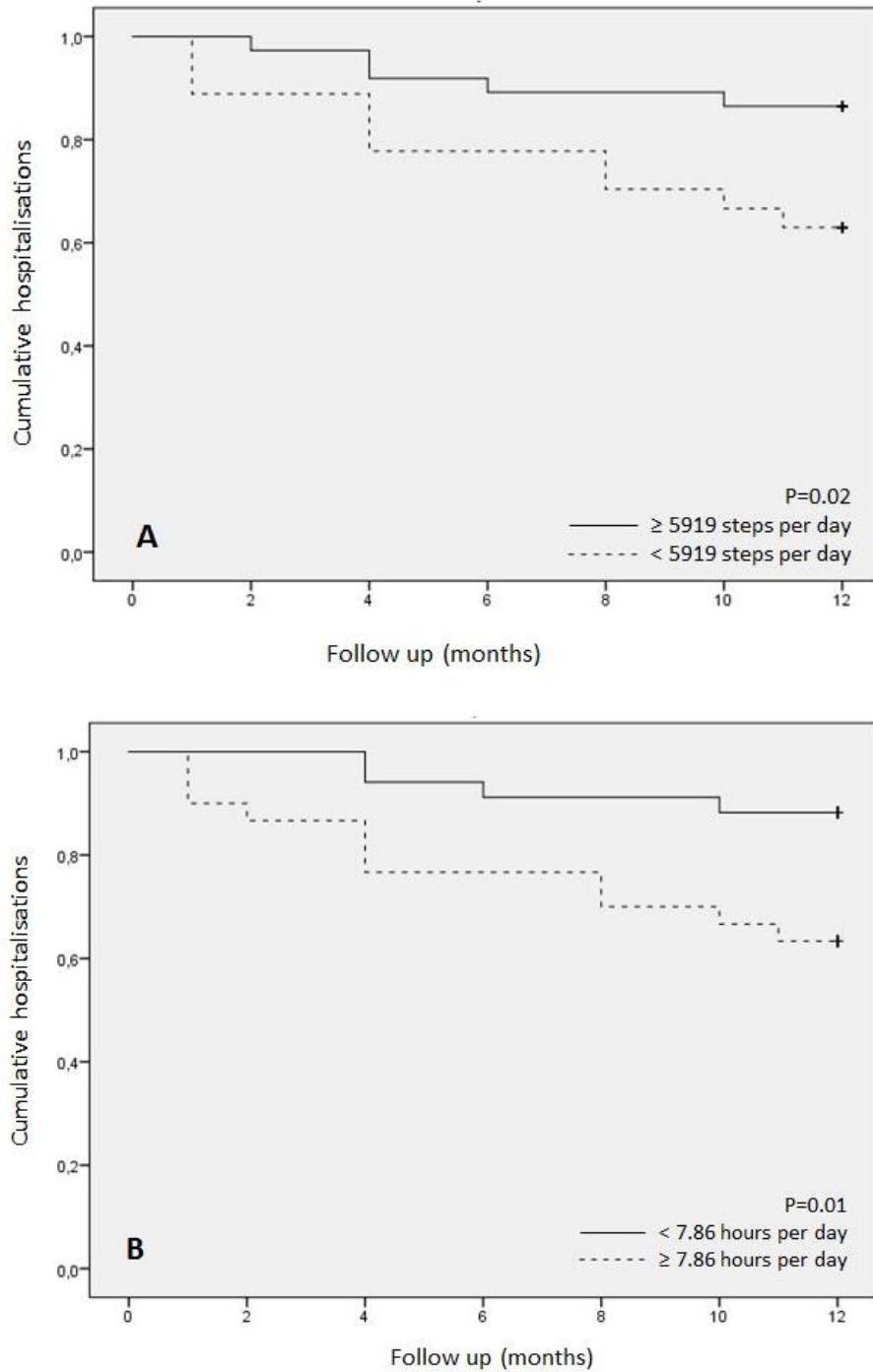
^a Could have more than one medication.

Online Table S4. Steps per day, sedentary time, moderate PA and MVPA cut-off points for hospitalisation including weekend data.

Hospitalisation variable	AUC (95% CI)	Sensitivity (%)	Specificity (%)	Best Cut-off	p value
Steps per day	0.71 (0.54 to 0.87)	65	67	5,919	0.017
Sedentary time (hours)	0.72 (0.57 to 0.87)	73	63	7.86	0.009
Moderate PA (min)	0.67 (0.50 to 0.84)	61	60	89.6	0.050
MVPA (min)	0.67 (0.50 to 0.84)	61	60	89.9	0.047

Abbreviations. AUC: area under the curve; CI: confidence interval; PA: physical activity; min: minutes; MVPA: moderate-to-vigorous physical activity.

Figure S1. Kaplan-Meier graphics according to ROC curve cut-off points including weekend data.
 1A. <5919 steps per day; 1B. ≥ 7.86 hours of sedentary behaviour.



Online Table S5. Crude and adjusted associations between level of physical activity in steps per day and sedentary time and bronchiectasis hospitalisations including weekend data.

	N	Crude OR (95% CI)	p value	Adjusted OR (95% CI) ^a	p value	Adjusted OR (95% CI) ^b	p value
Steps per day						-	-
High physical activity ($\geq 5,919$ steps per day)	37	1.00		1.00		-	-
Low physical activity ($< 5,919$ steps per day)	27	3.76 (1.11 to 12.80)	0.034	4.75 (0.89 to 25.48)	0.069	-	-
Sedentary time				-	-		
Sedentary (≥ 7.8 h)	34	4.34 (1.21 to 15.63)	0.025	-	-	2.96 (0.66 to 13.30)	0.158
Non-sedentary (< 7.8 h)	30	1.00		-	-	1.00	
Age (+1 year)	64	1.01 (0.97 to 1.05)	0.646	0.99 (0.94 to 1.04)	0.717	1.00 (0.95 to 1.05)	0.977
Gender			0.500		0.429		0.592
Male	21	1.00		1.00		1.00	
Female	43	0.66 (0.20 to 2.19)		0.55 (0.12 to 2.44)		0.68 (0.16 to 2.84)	
<i>Pseudomonas aeruginosa</i>			0.001		0.014		0.007
No	45	1.00		1.00		1.00	
Yes	19	8.89 (2.44 to 32.43)		6.12 (1.44 to 26.04)		7.17 (1.72 to 29.79)	
Hospitalisations 12 months prior to the study			0.007		0.013		0.028
No	51	1.00		1.00		1.00	
Yes	13	6.27 (1.66 to 23.62)		8.22 (1.55 to 43.62)		5.57 (1.21 to 25.75)	
MRC Dyspnoea Scale			0.347	-	-	-	-
1	12	1.00		-	-	-	-
2	39	2.41 (0.27 to 21.81)	0.435	-	-	-	-

3	10	7.33 (0.66 to 81.36)	0.105	-	-	-	-
4	3	-	-	-	-	-	-
FEV₁ (+1 %)	64	0.97 (0.94 to 1.00)	0.034	-	-	-	-
BSI stage			0.004	-	-	-	-
Mild	23	1.00		-	-	-	-
Moderate	22	1.66 (0.25 to 11.02)	0.601	-	-	-	-
Severe	19	11.67 (2.12 to 64.33)	0.005	-	-	-	-
6MWT (+1 meter)	64	0.99 (0.99 to 1.00)	0.050	-	-	-	-

Abbreviations. OR: odds-ratio; CI: confidence interval; h: hours; MRC: medical research council; FEV₁: forced expiratory volume in one second; BSI: bronchiectasis severity index; 6MWT: 6 minutes walking test.

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^a Initial multivariable model comprised age, gender, chronic colonisation by *Pseudomonas aeruginosa*, hospitalisations 12 months prior to the study, MRC Dyspnoea Scale, FEV₁ %predicted, BSI stage and 6MWT. Final multivariable model was adjusted for age, gender, chronic colonisation by *Pseudomonas aeruginosa* and hospitalisations 12 months prior to the study. Hosmer–Lemeshow goodness-of-fit test for the multivariable model, $p = 0.27$. Area under the ROC curve for the multivariable model, AUC = 0.86 (0.75 to 0.97).

^b Initial multivariable model comprised age, gender, chronic colonisation by *Pseudomonas aeruginosa*, hospitalisations 12 months prior to the study, MRC Dyspnoea Scale, FEV₁ %predicted, BSI stage and 6MWT. Final multivariable model was adjusted for age, gender, chronic colonisation by *Pseudomonas aeruginosa* and hospitalisations 12 months prior to the study. Hosmer–Lemeshow goodness-of-fit test for the multivariable model, $p = 0.14$. Area under the ROC curve for the multivariable model, AUC = 0.84 (0.72 to 0.96).