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OBSTRUCTIVE SLEEP APNOEA IS ASSOCIATED WITH A BETTER TREATMENT RESPONSE TO LONG-TERM NON-INVASIVE VENTILATION IN PATIENTS WITH COPD

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INTRODUCTION

- OSA and COPD are very common conditions and they are frequently co-occurring
- Long-term non-invasive ventilation (LT-NIV) may reduce the number of acute exacerbations (AE) in patients with COPD
- This effect could be due to treating underlying OSA; however, patients with concurrent OSA were usually excluded from large-scale international studies investigating the effects of LT-NIV in COPD.
- Aim: to assess the association between elevated baseline oxygen-desaturation index (ODI) and the number of subsequent AEs of COPD in an observational cohort study.

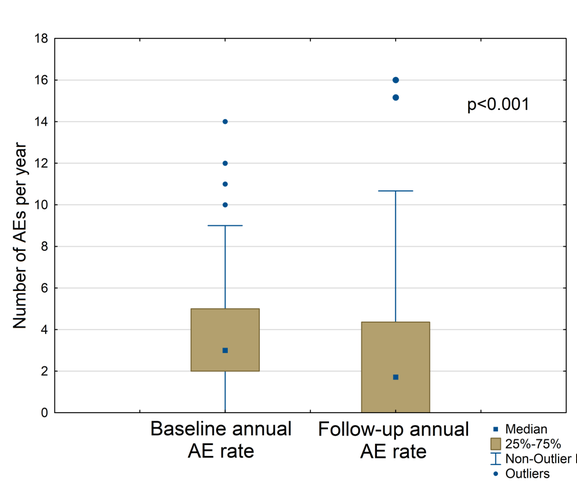
METHODS

- **Subjects:** patients with chronic hypercapnic COPD newly set up onto LT-NIV
- **Exclusion criteria**: previous LT-NIV or CPAP therapy
- **Design:** ambidirectional cohort clinical study (median follow-up 17 months)
- **Measurements and data collection**
  - Baseline and follow-up:
    - Medical history: comorbidities, exacerbation history (moderate and severe), smoking history
    - Blood picture
    - Capillary blood gas
    - NIV parameters, adherence (follow-up)
- **Outcomes and analysis:**
  - Primary outcome: **annualized exacerbation rate**
  - Grouping: Patients whose baseline ODI is > 5 / hour vs. ODI ≤ 5 / hour
  - Continuous variables: t-test and Mann-Whitney U-test
  - Categorical variables: Chi^2 and Fisher exact test
  - Effect of elevated ODI on normalising AE rate to below 2 / year: logistic regression

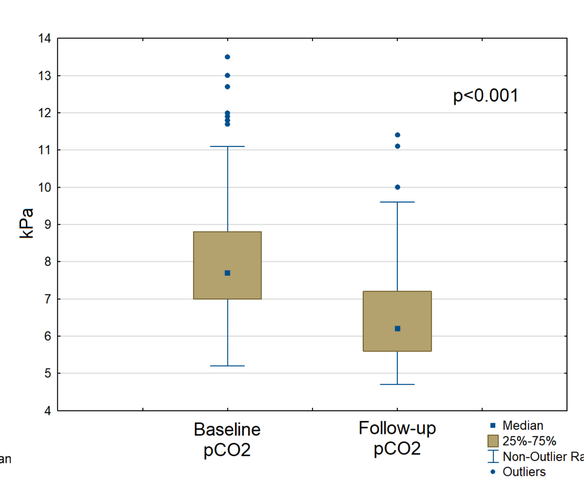
RESULTS

Variables	ODI > 5 (N=49)	ODI ≤ 5 (N=14)	P-value
Males, %	23 (47)	7 (50)	0.99
Age, years	66.0±9.1	68.1±6.9	0.41
BMI, kg/m^2	33.1±11.3	24.7±6.6	**0.01**
Ex-smoker/Active smoker, N	26/23	11/2	0.06
Pack-years	47 (40-60)	60 (40-90)	0.06
FVC, %pred	70.1±15.4	62.8±16.2	0.39
FEV_1, %pred	43.3±15.2	36.1 ±14.1	0.21
FEV_1/FVC	0.49 (0.34-0.63)	0.44 (0.30-0.45)	0.29
Charlson comorbidity index	2 (1-3)	2 (1-3)	0.36
Eosinophil % at baseline	2.56±1.49	2.15±1.41	0.40
Baseline pCO_2, kPa	7.09±0.99	7.57±1.06	0.12
Follow-up pCO_2, kPa	6.42±1.22	7.05±1.99	0.16
ODI, events/hour	14.7 (10.2-37.0)	3.9 (2.0-4.6)	**<0.01**
TST90, %	92 (68-99)	56 (18-95)	**0.01**
TST80, %	11 (3-45)	1 (0-3)	**0.02**
Baseline yearly AE rate	2 (1-4)	4 (3-5)	0.09
Follow-up yearly AE rate	0 (0-2)	3 (0-5)	**0.02**
Average daily NIV usage, h	6.4 (4.0-8.0)	7.5 (5.2-11.0)	0.09
>4 h usage/day, N (%)	34 (77)	11 (79)	0.99

Clinical characteristics of the participants. Data are presented as mean ± SD or median [IQR] or proportions



Boxplot of annual number of AEs before and after LT-NIV



Boxplot of capillary pCO2 before and after LT-NIV

	Follow up yearly AE rate ≥ 2	Follow up yearly AE rate < 2	P-value	Odds ratio (95% CI)
ODI ≤ 5, N (%)	9 (69)	4 (31)	**<0.01**	**6.6 (1.7-25.3)**
ODI > 5, N (%)	12 (26)	35 (74)		

Two-way table of elevated baseline ODI and normalized follow-up AE rate

CONCLUSIONS

- Long-term NIV **reduces the number of acute exacerbations** in patients with chronic hypercapnic COPD
- **Increased ODI is predictive of treatment success with LT-NIV in patients with hypercapnic COPD by reducing the number of AEs**

CONTACT

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