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Influenza Vaccine and Acute Exacerbations of Chronic Obstructive Pulmonary Disease: a Cross-sectional Study in Four Tertiary-level Hospitals in Peru

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INTRODUCTION

Influenza is a frequent infection associated with acute exacerbations of Chronic Obstructive Pulmonary Disease (COPD)[1-2]. Therefore, the influenza vaccine is recommended for the population at high risk of getting severe complications, such as chronic lung diseases like COPD[3].

OBJECTIVE

To determine the association between flu vaccination and COPD acute exacerbations through an observational, retrospective, cross-sectional, multicenter study at four hospitals in Peru.

METHODS

- Data was collected for patients in four hospitals in Lima-Peru between January 2015 and December 2017.
- We included 196 patients diagnosed with COPD based on *The Global Initiative for Chronic Obstructive Lung Disease* (GOLD) criteria (e.g., smoker or ex-smoker, reviewed spirometry test)[4-5]. Sociodemographic, clinical, and COPD-related variables were collected using questionnaires and medical records.
- Descriptive and multivariate analyses using multiple logistic regression were performed to measure the association between flu vaccination and COPD acute exacerbations.

POSTER HIGHLIGHT: We observed a significant relationship between flu vaccination and fewer exacerbations in Peruvian patients with COPD . Influenza vaccine could serve as an essential recommendation for this population with a high risk of severe complications.

Table 1: Demographic, clinical, and COPD-related characteristics. All patients were diagnosed with COPD based on the Global Initiative for Chronic Obstructive Lung Disease (GOLD) criteria.

Variable	N=196	%
Age ≥65	132	67.35
Gender, female	51	26.02
BMI >29.9	30	15.31
Current smoker	48	24.49
Comorbidities		
Hypertension	97	49.49
Diabetes mellitus 2	21	10.71
Dyslipidemia	21	10.71
Depression	30	15.31
Severity		
GOLD 1	61	31.12
GOLD 2	82	41.84
GOLD 3	44	22.45
GOLD 4	9	4.59
Oxygen use	12	6.12
Influenza vaccination	126	64.29
Exacerbation*	75	38.27

BMI: body mass index; COPD: Chronic Obstructive Lung Disease; GOLD: The Global Initiative for COPD.; GOLD 1, FEV1≥80; GOLD 2, FEV1:79-50; GOLD 3, FEV1: 49-30; GOLD 4, FEV1:<30; *At last, one exacerbation in the previous year.

Table 2: Multivariate analysis. Factors associated with acute COPD exacerbations in 196 patients.

Variable	Multiple regression		
	OR	CI 95%	*p-value*
Age ≥65 years	1.64	0.67-4.01	0.271
Gender, female	0.87	0.26-2.88	0.532
BMI >29.9	4.69	1.25-17.61	0.022[a]
Comorbidities			
Hypertension	1.69	0.73-3.91	0.217
Dyslipidemia	2.32	0.49-10.91	0.283
Severity			
GOLD 1	1.00	-	-
GOLD 2	0.51	0.15-1.68	0.271
GOLD 3	1.22	0.34-4.33	0.748
GOLD 4	1.73	0.09-33.20	0.714
Oxygen use	8.84	1.21-64.23	0.031[a]
Influenza vaccine	0.51	0.25-0.99	0.050[a]

[a] Statistically significant. Logistic regression analysis with bootstrapping.
GOLD: The Global Initiative for Chronic Obstructive Lung Disease.
GOLD 1, FEV1≥80; GOLD 2, FEV1:79-50; GOLD 3, FEV1: 49-30; GOLD 4, FEV1:<30.

RESULTS

The median age was 69 (IQR: 63-75) years, 51 (26%) were female, 48 (24.4%) were current smokers, 148 (75%) were ex-smokers, 97 (49.4%) had hypertension, 21 (10.7%) diabetes mellitus type 2, 21 (10.7%) dyslipidemia and 30 (15.3%) depression.

A total of 126 patients had a flu vaccination, and 75 (38.3%) had at least one COPD exacerbation. Sixty-one (31.1%) patients were classified as GOLD 1, 82 (41.8%) GOLD 2, 44 (22.4%) GOLD 3 and 9 (4.5%) as GOLD 4 **(Table 1)**.

In this study, flu vaccination was associated with statistically significant fewer exacerbations (OR=0.51, (CI 95% 0.25-0.99)). Additionally, having BMI>29.9 and oxygen use were related to having more COPD exacerbations. Other variables These results were not statistically significant (**Table 2**).

CONCLUSIONS

- Even though the study has limitations, such as including a medium size sample and its retrospective observational nature, a borderline statistically significant relationship between flu vaccination and fewer exacerbations in Peruvian patients with COPD was observed (CI 95% close to include 1 and p-value exactly 0.05).
- This is consistent with results reported in clinical trials and other real-world studies outside this region[6,7]. These results support the positive impact of flu vaccination for its possible protective value in COPD on top of the prevention of influenza in this population[8].
- Therefore, the Influenza vaccine could serve as an essential recommendation for this population with a high risk of severe complications[9].

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