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Introduction

Chronic obstructive pulmonary disease (COPD) increase all-cause of mortality and infection risks in general population. However, rare study investigates the infection risks among hemodialysis (HD) with COPD. This population-based cohort study aimed to evaluate the mortality and pneumonia risks of COPD among end-stage renal disease (ESRD) patients receiving HD.

Methods

From the Taiwan National Health Insurance Research Database, 75,868 Taiwanese hemodialysis patients were screened for eligibility between January 1, 1998 and December 31, 2006. COPD was defined by a specific diagnosis code and COPD-related medications. After excluding patients age less than 40 year-old and receiving renal transplantation before and after enrollment, we included a total of 8,480 patients who were diagnosed COPD, and matched them 1:1 with 8,480 controls by age, gender, urbanization, and economic status. Participants were followed up for the occurrence of death, hospitalization of pneumonia, or until 2008. Cumulative incidences and hazard ratios were calculated after adjusting for competing mortality.

Table 1 Characteristics in HD patients with and without COPD

	HD with COPD (n = 8,480)		HD without COPD (n = 8,480)		P
	n	%	n	%	
Age group, years					1
40-49	527	6.2	527	6.2	
50-59	1225	14.5	1225	14.5	
60-69	2469	29.2	2469	29.2	
≥70	4232	50.1	4232	50.1	
Sex					1
Male	5006	59.0	5006	59.0	
Female	3474	41.0	3474	41.0	
Urbanization					1
City area	5709	67.3	5709	67.3	
Rural area	2771	32.7	2771	32.7	
Socioeconomic status					1
Low economics	3246	38.3	3246	38.3	
Moderate economics	2467	29.1	2467	29.1	
High economics	2767	32.6	2767	32.6	
Comorbidity					
Diabetes mellitus	4326	51.0	4255	50.2	0.276
Hypertension	6575	77.5	6436	75.9	0.012
Hyperlipidemia	1355	16.0	1447	17.1	0.057
CHF	2317	27.3	1678	19.8	<0.001
CVD	1413	16.7	1110	13.1	<0.001
CAD	3478	41.0	2979	35.1	<0.001
Cancer	461	5.4	784	6.3	0.453
Prescribed drugs					
Antiplatelets	2243	26.5	1596	18.8	<0.001
Statin	1225	14.4	991	11.7	<0.001
ACEIs	2107	24.8	1567	18.5	<0.001
ARBs	2276	26.8	1615	19.0	<0.001
Beta blockers	2881	34.0	2418	28.5	<0.001
CCBs	5114	60.3	3870	45.6	<0.001
NSAIDs	1620	19.1	1060	12.5	<0.001
PPIs	772	9.1	523	6.2	<0.001
Corticosteroid	1064	12.5	428	5.0	<0.001

Figure 1. Study flow chart

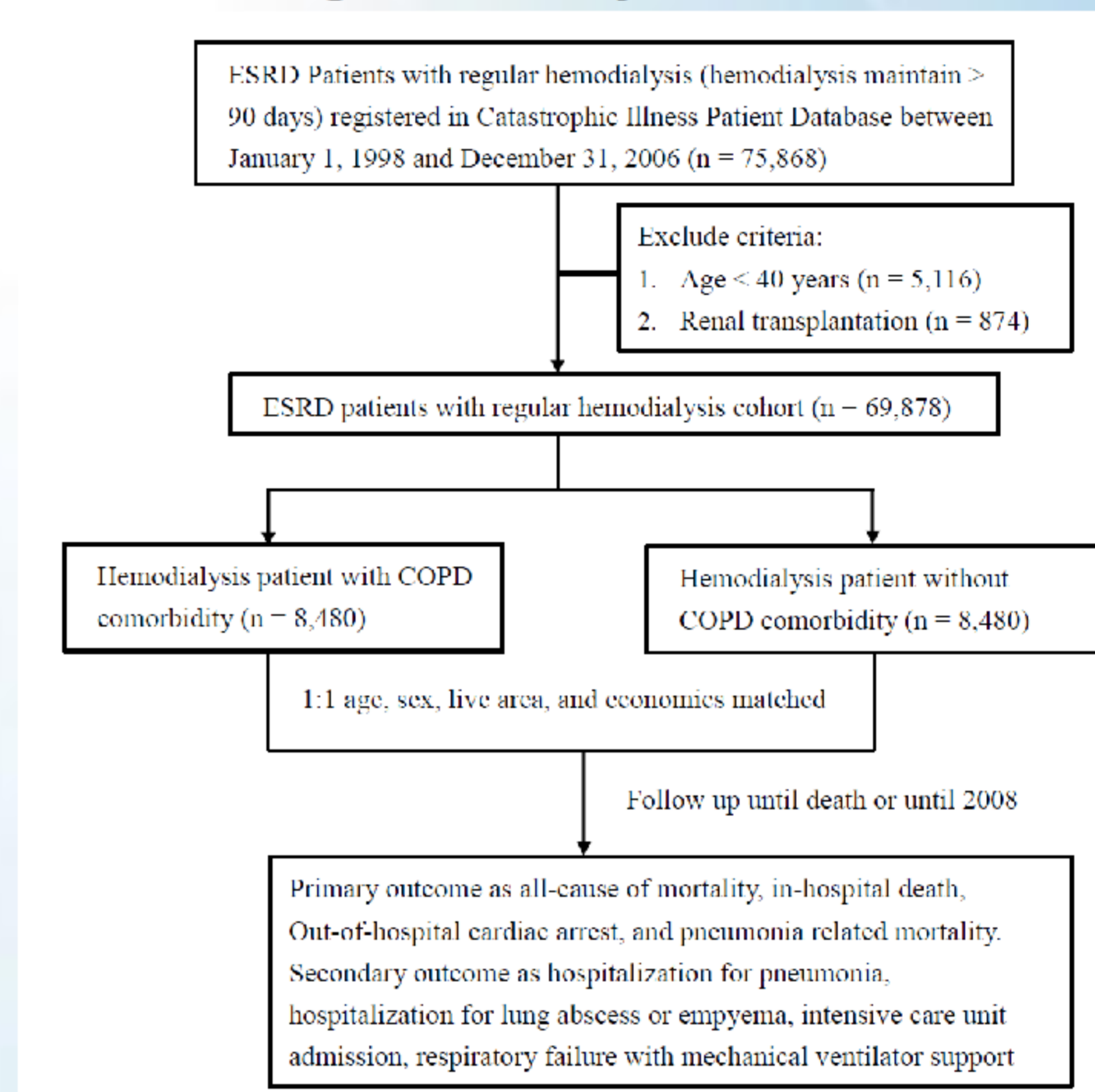


Figure 2. Cumulative incidence of all cause of mortality (A) and hospitalization of pneumonia (B) among HD patients with and without COPD

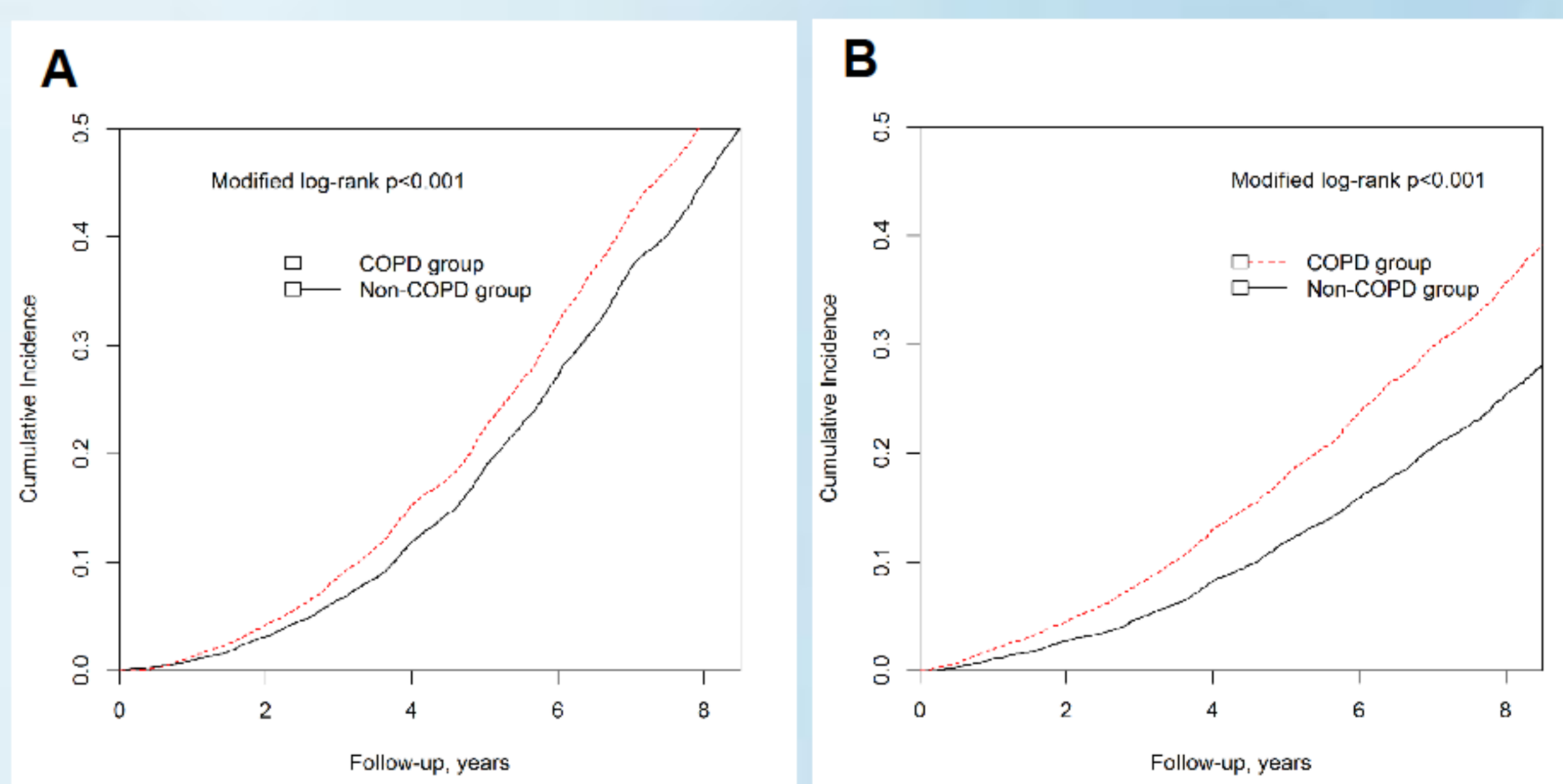


Table 2 Infection outcomes and death between HD patients with and without COPD

	Model 1†	Model 2‡
Primary outcomes		
All cause of mortality	1.179 (1.126-1.233)	1.165 (1.113-1.220)
In-hospital death	1.247 (1.181-1.317)	1.232 (1.166-1.302)
Out-of-hospital cardiac arrest	0.980 (0.828-1.160)	0.968 (0.816-1.148)
Pneumonia related mortality	1.206 (1.022-1.422)	1.188 (1.006-1.403)
Secondary outcomes		
Hospitalization for pneumonia	1.572 (1.478-1.672)	1.516 (1.425-1.613)
Hospitalization for lung abscess or empyema	1.192 (1.135-1.252)	1.180 (1.123-1.240)
Intensive care unit admission	1.165 (1.115-1.217)	1.171 (1.120-1.224)
Respiratory failure with mechanical ventilator support	1.543 (1.439-1.655)	1.545 (1.440-1.658)

†Model 1: Adjusted for comorbid disorders (diabetes mellitus, hypertension, hyperlipidemia, congestive heart failure, history of cerebrovascular disease, history of coronary artery disease, peripheral vascular disease, and cancer), and competing mortality
‡Model 2: Adjusted for comorbid disorders, medications (antiplatelets, statin, ACEIs, ARBs, Beta blockers, CCBs, warfarin, NSAIDs, PPIs, systemic corticosteroid), and competing mortality

Results

Kaplan-Meier survival analysis showed a significantly higher cumulative incidence of mortality and hospitalization of pneumonia among HD patients with COPD as compared to those without. As compared with the comparison cohort, HD patients with COPD was associated with multivariate-adjusted hazard ratios of 1.165 (95% CI, 1.113 - 1.220) for death and 1.516 (95% CI, 1.425 - 1.613) for hospitalization of pneumonia after adjusting comorbid disorders, drugs prescription during follow up, and competing mortality.

Conclusion

Our study suggests an increased risk of pneumonia and all-cause of mortality among HD patients with COPD. Careful monitoring of physical health and proper integration between nephrologists and pulmonologists should be stressed to reduce poor clinical outcomes in this vulnerable population.

References

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