

# Comparison of mortality between Aspiration and Infectious pneumonia who received ICU care for sepsis

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## Introduction

- Pneumonia complicated by septic shock is associated with significant mortality.
- Aspiration pneumonia is a common problem in older people with high mortality. Its prevalence is escalating globally with the aging of population.
- Aspiration pneumonia has a high mortality rate, particularly in patients with septic shock.
- Aim of present study is to compare the mortality between Aspiration Pneumonia and Infectious Pneumonia in patients who received ICU care for sepsis.

## Method

- In this retrospective clinical study, adult patients who received ICU care for pneumonia sepsis were included.
- Patients were classified into two groups:
  - **(1) Infectious pneumonia** : *Signs and Symptoms* of pneumonia with *Radiographic confirmation* on chest x-ray or Chest CT and confirmed as an acute infection by various pathogens with *culture study*.
  - **(2) Aspiration pneumonia** : *Signs and Symptoms* of pneumonia and *Symptoms of Aspiration* with *Radiographic confirmation* on chest x-ray or Chest CT (evidence of *Gravity-dependent opacity* on Chest CT) and *confirmed by two experienced clinician*.
- Kaplan-Meier survival curves were used to evaluate In-hospital mortality for infectious pneumonia and Aspiration pneumonia.
- Log-rank test was conducted to evaluate differences in in-hospital mortality between curves.
- The Variables were collected including age, sex, **SAPS3**(Simplified Acute Physiology Score 3), **CCI**(Charlson Comorbidity Index), **SOFA**(Sequential Organ Failure Assessment) to predict mortality and evaluate severity.
  - **SAPS3 : 0-217 points**, the total of three subscores ; *Before admission, the circumstance of the admission, and the extent of physiological derangement within 1 hour before or after ICU admission*, is used to **predict the mortality risk for patients presenting at the ICU**.
  - **CCI : 0-37 points**, **predicts the long term mortality** for a patients who may have a range of *comorbid conditions*.
  - **SOFA : 0-24 points**, six different scores(*respiratory, cardiovascular, hepatic, coagulation, renal, neurological systems*) to **determine rate of organ failure**.

## Results

**Table 1.** Baseline characteristics between Infectious pneumonia and Aspiration pneumonia group.

Variables	Total (n=70)	Groups		P value
		Infectious pneumonia (n=36)	Aspiration pneumonia (n=34)	
Age, y	77.12±10.60	75.58±10.44	78.76±10.66	0.212
Men, %	44(62.9)	22(61.1)	22(64.7)	0.808
SAPS 3	75.37±20.33	79.22±20.62	71.29±19.51	0.103
CCI	6.39±2.79	6.64±3.3	6.11±2.14	0.438
SOFA	7.89±3.46	8.88±3.48	6.82±3.15	0.012*
ICU length of stay, d	15.38±15.02	12.25±12.92	18.71±16.52	0.072
In hospital mortality, %	28(40)	19(52.8)	9(26.5)	0.025*
Cardiovascular disease, %	48(68.6)	25(69.4)	23(67.6)	0.871
Chronic lung disease, %	18(25.7)	15(41.7)	3 (8.8)	0.002*
Chronic neurological disease, %	36(51.4)	9 (25.0)	27 (79.4)	<0.001*
Chronic liver disease, %	7(10)	5 (13.9)	2 (5.9)	0.264
Diabetes, %	20(28.6)	12 (33.3)	8 (23.5)	0.364
Chronic kidney disease, %	15(21.4)	10 (27.8)	5 (14.7)	0.183
Immunocompromized, %	10(14.3)	7 (19.4)	3 (8.8)	0.204
Solid malignant tumors, %	19(27.1)	9(25.0)	10 (29.4)	0.678
Endocrine(Thyroid), %	10(14.3)	6 (16.7)	4 (11.8)	0.558

Data are presented as means ± SD, median (IQR), or percentage.  
Abbreviations: SAPS3, Simplified Acute Physiology Score 3 ; CCI, Charlson Comorbidity Index ; SOFA, Sequential Organ Failure Assessment

✓ The **SOFA** score was significantly higher in the the **Infectious pneumonia group** than that in the Aspiration pneumonia group(8.88±3.48 vs 6.82±3.15, **p=0.012**).

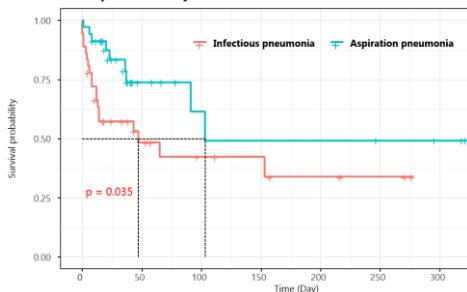
**Table 2.** Baseline characteristics between Alive and In hospital death group.

Variables	Total (n=70)	Groups		P value
		Alive (n=42)	In hospital death (n=28)	
Age, y	77.12±10.60	75.73±10.49	79.21±10.60	0.181
Men, %	62.9	25(59.5)	19(67.9)	0.480
SAPS 3	75.37±20.33	69.17±18.40	84.68±19.83	0.001*
CCI	6.39±2.79	6.07±2.74	6.86±2.84	0.251
SOFA	7.89±3.46	7.07±3.18	9.11±3.56	0.015*
ICU length of stay, d	15.38(6.00,20.25)	16.05(6.00,21.25)	14.39(4.25,18.00)	0.498
Aspiration Pneumonia, %	34(48.6)	25(59.5)	9(32.1)	0.025*
Cardiovascular disease, %	48(68.6)	29(69.0)	19(67.9)	0.916
Chronic lung disease, %	18(25.7)	6(14.3)	12(42.9)	0.007*
Chronic neurological disease, %	36(51.4)	27(64.3)	9(32.1)	0.008*
Chronic liver disease, %	7(10)	2(4.8)	5(17.9)	0.074
Diabetes, %	20(28.6)	16(38.1)	4(14.3)	0.037*
Chronic kidney disease, %	15(21.4)	9(21.4)	6(21.4)	1.000
Immunocompromized, %	10(14.3)	5(11.9)	5(17.9)	0.486
Solid malignant tumors, %	19(27.1)	9(21.4)	10(35.7)	0.188
Endocrine(Thyroid), %	10(14.3)	7(16.7)	3(10.7)	0.486

✓ The proportion of **chronic lung disease** was significantly higher in the **in-hospital death group** than that in the alive group(12(42.9%) vs 6(14.3%), **p=0.007**)

✓ The **SAPS3**(84.68±19.83 vs 69.17±18.40, **p=0.001**)and **SOFA** (9.11±3.56 vs 7.07±3.18, **p=0.015**)score were significantly higher in the **in-hospital death group** than that in the alive group, respectively.

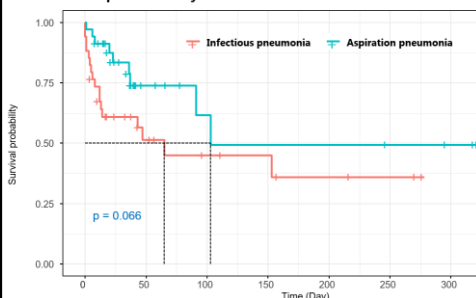
**In hospital mortality**



**Figure 1.** Kaplan-Meier survival curves of In hospital mortality for Infectious pneumonia and Aspiration pneumonia group.

✓ **Higher survival rate in Aspiration pneumonia group** than in infectious pneumonia group, which made a significant difference in the log-rank test (**p=0.035**)

**In hospital mortality**



**Figure 2.** Kaplan-Meier survival curves of In hospital mortality for Infectious pneumonia and Aspiration pneumonia group after propensity score matching adjusting SOFA.

✓ **No significant difference** in the log-rank test (**p=0.066**) between Infectious pneumonia and Aspiration pneumonia group

## Conclusion

- We found higher mortality rate in Infectious Pneumonia group than in Aspiration Pneumonia group, but there were **no significant difference** in the log-rank test(**p=0.066**) in propensity score matching adjusting SOFA score using Kaplan-Meier model.
- The limitation of the study was attributed to difference in disease severity between Infectious pneumonia group and Aspiration pneumonia group that may attribute higher mortality rate in infectious pneumonia.
- The number of subjects in this study was small. A study with larger number of subjects is needed.