Clinical epidemiology and outcomes of invasive pulmonary aspergillosis as a complication of respiratory viral infection in hospitalized patients.

Lily He, PharmD, MS (candidate); Bertha De Los Santos, PharmD, MS (candidate); Brian J. Barnes, PharmD, MS; Nicholas S. Britt, PharmD, MS, BCPS, BCIDP

University of Kansas School of Pharmacy (KUMC Health Informatics , KU Frontiers Clinical and Translational Science Institute)

INTRODUCTION

- Invasive pulmonary aspergillosis (IPA) infections are difficult to diagnose, treat, and are associated with a high risk of death
- IPA is previously associated with immunosuppressive treatments in those undergoing stem cell or solid organ transplantation
- IPA is recognized as a complication of severe influenza infection, although the association between IPA and other respiratory viral infections (RVI) is unclear

OBJECTIVES

- Investigate the risk of developing IPA following RVI caused by a variety of respiratory viral pathogens
- Identify associated risk factors
- Evaluate the impact of RVI-associated IPA on patient outcomes and mortality

METHODS

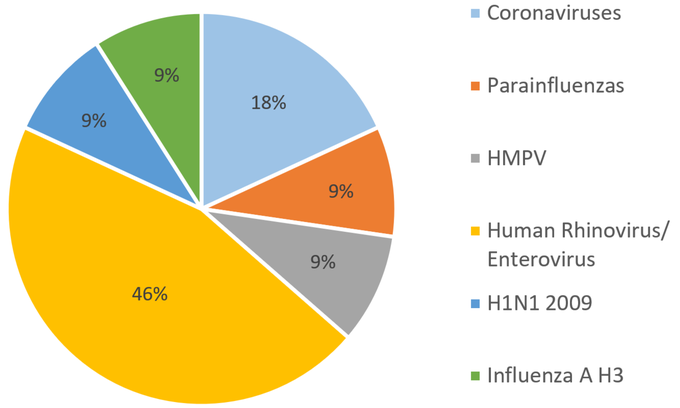
- In-progress study using a retrospective cohort design
- Evaluated inpatient admissions between September 30, 2018, and October 5, 2019
- Inclusion criteria:
  - Patients 18 years old and above
  - Admission to the University of Kansas Hospital
  - Multiplex PCR positive for respiratory virus from a nasopharyngeal swab, nasal wash, or bronchoalveolar lavage specimen
- Exclusion criteria:
  - Proven or probable IPA prior to RVI
  - Admission duration <24 hours
- Statistical analysis and time-to-death was evaluated using Kaplan-Meier curves, hazard ratios, and log-rank testing

TABLE 1: BASELINE CHARACTERISTICS

Characteristic n (%) unless specified otherwise	IPA Group (n=11)	Non-IPA Group (n=126)	P Value
Age in years, mean (SD)	64 (± 11.6)	57 (± 18.1)	0.235
Female	3 (27.3)	65 (52.4)	0.128
Tobacco Use			0.905
Current	1 (9.1)	23 (18.3)	
Former	5 (45.5)	46 (36.5)	
Never	5 (45.5)	51 (40.5)	
Unknown	0 (0.0)	6 (4.8)	
Chronic Pulmonary Disease	5 (45.5)	54 (42.9)	> 0.999
Diabetes	1 (9.1)	37 (29.4)	0.29
Renal Disease (moderate-severe)	2 (18.2)	28 (22.2)	> 0.999
Liver Disease (moderate-severe)	0 (0.0)	10 (7.9)	> 0.999
Non-Metastatic Solid Tumor	0 (0.0)	10 (7.9)	> 0.999
Leukemia	6 (54.5)	10 (7.9)	< 0.001
Lymphoma/Multiple Myeloma	1 (9.1)	20 (15.9)	> 0.999
Metastatic Solid Tumor	0 (0.0)	4 (3.2)	> 0.999
AIDS	0 (0.0)	3 (2.4)	> 0.999
Charleston Index Score, median (IQR)	5 (3-5)	5 (3-6)	> 0.866
Prior Immunosuppressant Use	5 (45.5)	30 (23.8)	0.15
Prior Corticosteroid Use	10 (90.9)	34 (27.2)	< 0.001
Prophylactic Antibiotic Use	10 (90.9)	83 (66.4)	0.173
Prophylactic Antifungal Use	7 (63.6)	16 (12.7)	< 0.001
ID Consult	7 (63.6)	25 (20.3)	0.004
SOFA Score, median (IQR)	2 (0-3)	1 (0-3)	0.670
Total APACHE II Score, median (IQR)	16 (11-25)	12 (7-17)	0.154
ICU Admission	5 (45.5)	37 (30.1)	0.320

PREVIOUS RVI IN IPA GROUP

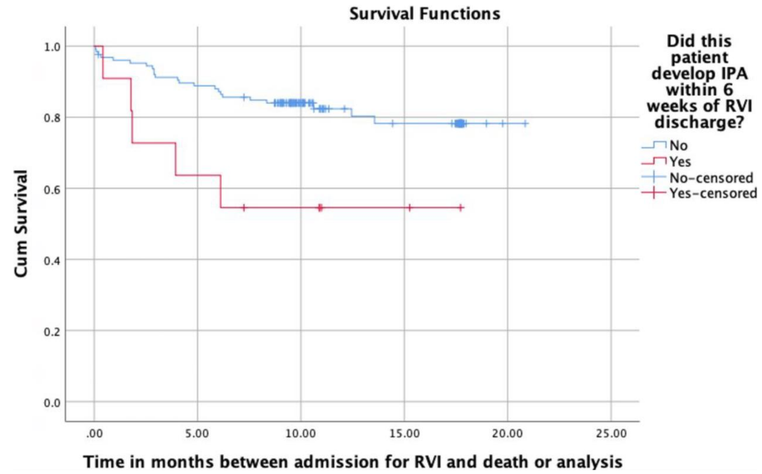
Of the 11 eligible IPA patients, 5 of them had a recent history of human rhinovirus or enterovirus and only 2 had a history of influenza (including H1N1 and Influenza A)



OUTCOME MEASUREMENTS

Outcome n (%)	IPA Group (n=11)	Non-IPA Group (n=126)	P Value
Inpatient Mortality	1 (9.1)	4 (3.2)	0.346
6-Week Mortality	1 (9.1)	6 (4.8)	0.451
12-Week Mortality	3 (27.3)	12 (9.5)	0.103

LOG-RANK (MANTEL-COX) MORTALITY CURVE



CONCLUSIONS

- IPA more commonly occurred in patients with non-influenza RVIs, suggesting that this complication is not limited to influenza
- There is an increased need for mechanical ventilation and increased mortality among those experiencing IPA following RVI
- Clinicians should be aware of the potential complications of severe RVI
- Future research into appropriate prophylaxis and treatment of post-RVI IPA is needed

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