Poster #672

Coinfections with Respiratory Syncytial Virus (RSV) in a Cohort of Adults with Pre-Existing Comorbidities in Wisconsin from 2015-16 through 2019-20

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Background

- Coinfections with respiratory syncytial virus (RSV) and another respiratory pathogen may affect symptom and disease severity
- There are limited data regarding symptoms in adults with pre-existing comorbidities who have RSV coinfections

Objective

- Compare demographic and clinical (signs, symptoms, and hospitalization) characteristics between those with RSV coinfection vs. RSV single infection

Methods

- Retrospective cohort of participants of an influenza vaccine effectiveness study in Wisconsin from 2015-2020 respiratory virus winter seasons
- Participants in an outpatient setting self-reported clinical symptoms at enrollment during each season of the study
- Analysis includes participants aged ≥18 years at the time of original study enrollment with ≥1 pre-existing comorbidities
- Residual respiratory specimens were retested via RT-PCR using the GenMark Respiratory Pathogen (RPP) panel for adenovirus, seasonal coronaviruses, human metapneumovirus, rhinovirus/enterovirus, Chlamydia pneumonia, Mycoplasma pneumonia, influenza virus (influenza A H1pdm09, H3, and B), human parainfluenza virus types 1-4, RSV A and B
- RSV coinfection was defined as the detection of two or more viral pathogens tested, one of which was RSV A or B and the other non-RSV
- Prevalence of RSV single infection and RSV coinfection were calculated from proportion of individuals with RSV A or B, and RSV A or B and another non-RSV pathogen, respectively (Table 1)

Results

Table 1. Demographic and clinical characteristics among adults with pre-existing comorbidities who had RSV coinfection and RSV single infection from 2015-2020 respiratory virus winter seasons

	Total respiratory samples tested from high-risk adults [a,b]	Total RSV-positive	RSV coinfection	RSV single infection	P-value for comparison between RSV coinfection and single infection
	N	n (%)	n (%)	n (%)	
Overall: N	3601	303	18	285	
Sociodemographic characteristics					
Age group					0.09
18-49 years	1457	90 (29.7)	9 (50.0)	81 (28.4)	
50-59 years	697	58 (19.1)	5 (27.8)	53 (18.6)	
60-64 years	367	35 (11.6)	1 (5.6)	34 (11.9)	
≥ 65 years	1080	120 (39.6)	3 (16.7)	117 (41.1)	
Sex					0.15
Male	1243	104 (34.3)	9 (50.0)	95 (33.3)	
Female	2358	199 (65.7)	9 (50.0)	190 (66.7)	
Vaccination status					
Received influenza vaccine in the past year	2203	211 (69.6)	10 (55.6)	201 (70.5)	0.18
Received pertussis vaccine ever	3427	288 (95.0)	17 (94.4)	271 (95.1)	0.90
Received pneumococcal vaccine ever	2135	206 (67.9)	10 (55.6)	196 (68.8)	0.24
Clinical characteristics					
Illness signs and symptoms[c]					
Fever/feverishness	2303	168 (55.4)	11 (61.1)	157 (55.1)	0.62
Fatigue/feeling run down	3365	283 (93.4)	17 (94.4)	266 (93.3)	0.85
Nasal congestion	2962	278 (91.7)	16 (88.9)	262 (91.9)	0.65
Wheezing	2207	227 (74.9)	13 (72.2)	214 (75.1)	0.79
Shortness of breath/trouble breathing	2392	222 (73.3)	10 (55.6)	212 (74.4)	0.08
Sore throat	2418	195 (64.4)	13 (72.2)	182 (63.9)	0.47
Muscle pain/myalgia[c]	580	42 (62.7)	4 (66.8)	38 (62.3)	0.83
Headache[c]	634	48 (71.6)	4 (66.8)	44 (72.1)	0.78
Vomiting[c]	301	27 (40.3)	3 (50.0)	24 (39.3)	0.61
Hospitalization in the 30 days after study enrollment	96	10 (3.3)	0	10 (3.5)	--
High risk conditions[d]					
Any cardiac disorder	2470	211 (69.6)	11 (61.1)	200 (70.2)	0.42
Any chronic respiratory condition	1568	140 (46.2)	8 (44.4)	132 (46.3)	0.88
Chronic liver conditions	494	49 (16.2)	3 (16.7)	46 (16.1)	0.95
Chronic kidney disorders	1109	104 (34.3)	6 (33.3)	98 (34.4)	0.93
Diabetes	908	87 (28.7)	5 (27.8)	82 (28.8)	0.93
Any immunocompromising condition[e]	226	27 (8.9)	2 (11.1)	25 (8.8)	0.74

N = number of participants; n = number of participants in a given category.
[a] It is possible for individuals to have been enrolled more than once in a given respiratory virus season, provided illnesses were at least 14 days apart. However, there were no individuals with more than one study-identified RSV-positive ARI in the same respiratory virus season.
[b] RSV coinfection was identified in 5.9% of RSV-positive adults and RSV single infection in 94.1%.
[c] Participants were asked about these signs and symptoms at enrollment during each season of the initial test-negative design study. Information regarding muscle pain/myalgia, headache, and vomiting was only collected during the 2019-20 winter respiratory virus season.
[d] Cardiac disorders, chronic respiratory conditions, chronic liver conditions, chronic kidney disorders, diabetes, and 'immunocompromised' definitions are not mutually exclusive. For example, it is possible for an individual to have both a cardiac disorder and an immunocompromising condition.
[e] Immunocompromising conditions include individuals with transplants (not restricted to solid organ transplant), malignancies, immunosuppressive therapy, and/or other immunodeficiencies.

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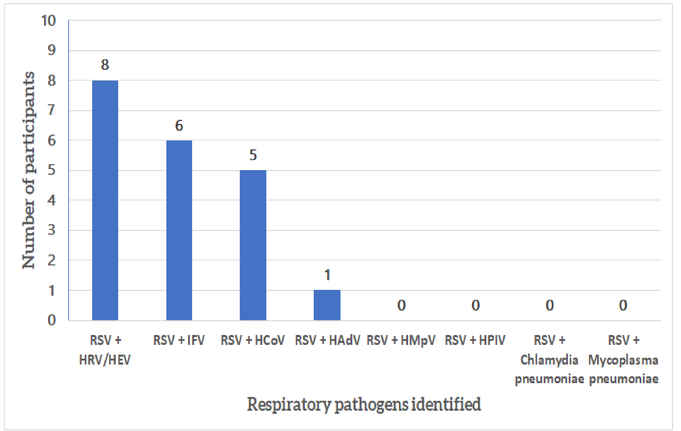

- Of 3601 respiratory samples from adults with ≥1 pre-existing comorbidity, RSV coinfection was detected in 18 (0.5%), RSV single infection in 285 (7.9%) participants
- RSV co-infection was detected in 5.9% of RSV-positive participants
- RSV coinfections were highest among those aged 18-49 years (9; 50%)
- Hospitalization occurred only in individuals with RSV single infection (10, 4%)

Conclusions

- RSV viral co-infections were not common among adults with ≥1 pre-existing comorbidities
- No significant differences between RSV coinfections vs. single RSV infections by presence of upper or lower respiratory symptoms, or by pre-existing comorbidities
- Limitations of this analysis include its sample size, outpatient cohort and limited sensitivity of the multiplex assay