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A retrospective study on impact of antibiotic therapy on mortality in viral respiratory infections

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1c. Influenza and respiratory viruses (incl. diagnostics & epidemiology, antiviral drugs, vaccines, treatment & susceptibility / resistance)

Likely attendance

Onsite

Oral presentation

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Background

The majority of patients admitted to hospital with acute respiratory infections and proven viral infection are prescribed antibiotics. Concern of bacterial viral co-infection may underlie this practice. Lessons from the Covid-19 pandemic suggest that antibiotics can safely be withheld in most patients with viral respiratory infections, and that fear of bacterial co-infections may be exaggerated. To explore this, we assessed the impact of antibiotic therapy on mortality in patients admitted to hospital with viral respiratory infection.

Methods

We conducted a retrospective cohort study from 2017 to 2021 of adult patients admitted to Akershus University Hospital with a nasopharyngeal or throat swab at hospital admittance positive for influenza virus [H3N2, H1N1, influenza B], respiratory syncytial virus or severe acute respiratory syndrome coronavirus 2. Severity of disease was assessed by National Early Warning Score (NEWS) at baseline. The primary outcome was all-cause 30-day mortality. We calculated antibiotic days of therapy (DOT) for each patient, and used the Kaplan-Meier estimator and adjusted Cox proportional hazards models to assess the impact of antibiotic therapy on survival.

Results

A total of 2111 patients were included in the analysis (Figure 1). Antibiotic therapy was initiated at admission in 54.6% of the patients and overall 62.6% received antibiotics during hospitalization (Table 1). The 30-day mortality rate was 8.0%. Patients prescribed antibiotics during hospitalization had lower survival as assessed by the Kaplan-Meier estimator (Figure 2). In analyses adjusted for virus, sex, age, severity of disease at baseline, and comorbidities, antibiotics prescribed during hospitalization (hazard ratio [HR] 2.10, 95% CI 1.31 - 3.38) and days of antibiotic therapy (HR per DOT 1.03, 95% CI 1.01-1.05) were associated with increased 30-day mortality, whereas antibiotics initiated at hospital admission was not (hazard ratio 1.16, 95% CI 0.81 - 1.68).

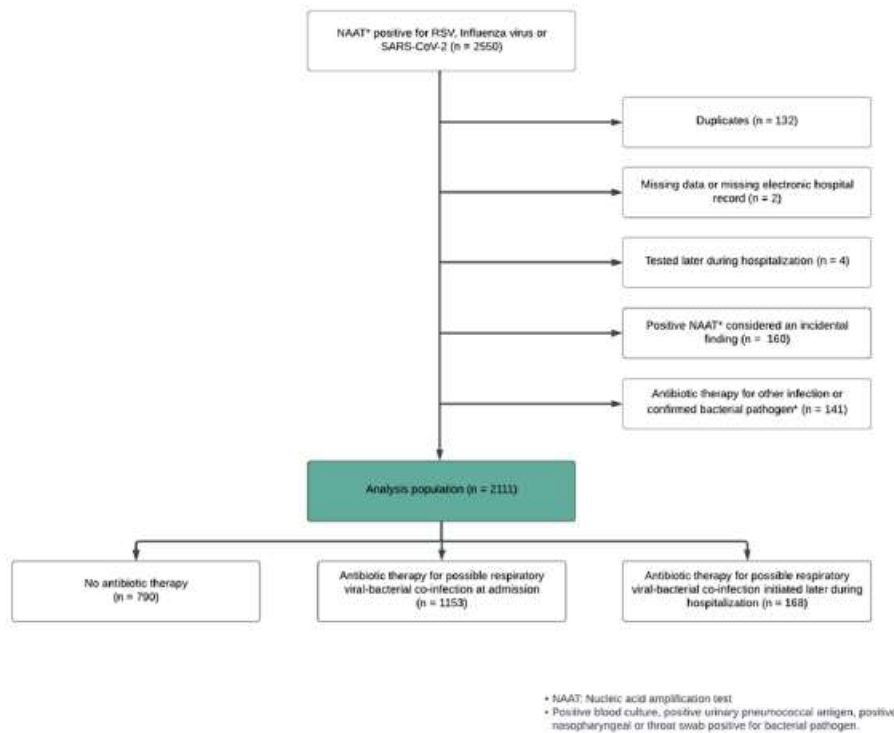
Conclusions

No protective association between in-hospital antibiotic therapy and 30-day mortality suggests that a restrictive antibiotic strategy in viral respiratory infections is warranted.

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Prospective randomized studies are needed to determine whether patients admitted to hospital with viral respiratory infection should be treated with antibiotics.

FIGURE 1



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TABLE 1

Table 1 | Demographic data, virus, NEWS2 score at admission and antibiotic treatment according to 30-day mortality status

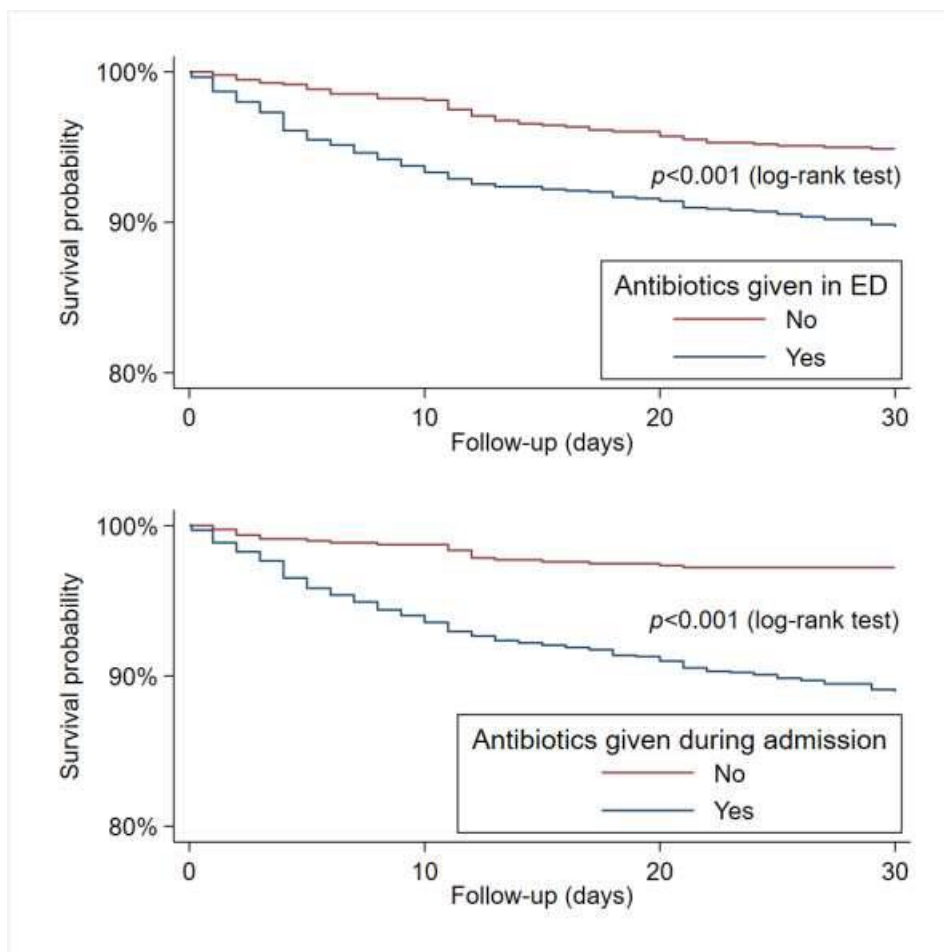
	30-day mortality		P-value
	Survivors (n = 1943)	Non-survivors (n = 168)	
Male sex, n (%)	998 (51.4%)	98 (58.3%)	0.083
Age, years	68.3 (52.6 - 78.5)	77.1 (71.1 – 84.2)	<0.001
Virus			0.054
Influenza A, n (%)	623 (32.1%)	38 (22.6%)	
Influenza B, n (%)	252 (13.0%)	22 (13.1%)	
RSV, n (%)	393 (20.2%)	36 (21.4%)	
SARS-CoV-2, n (%)	675 (34.7%)	72 (42.9%)	
Comorbidity			
Cardiovascular disease, n (%)	652 (33.6%)	100 (59.5%)	<0.001
Diabetes mellitus, n (%)	346 (17.8%)	48 (28.6%)	<0.001
COPD, n (%)	343 (17.7%)	52 (31.0%)	<0.001
Asthma, n (%)	268 (13.8%)	17 (10.1%)	0.18
Hypertension, n (%)	642 (33.0%)	71 (42.3%)	0.015
Overweight and obesity, n (%)	156 (8.0%)	6 (3.6%)	0.037
Active cancer, n (%)	159 (8.2%)	24 (14.3%)	0.007
Dementia, n (%)	115 (5.9%)	28 (16.7%)	<0.001
Chronic kidney disease, n (%)	155 (8.0%)	28 (16.7%)	<0.001
Liver disease, n (%)	25 (1.3%)	3 (1.8%)	0.59
Neurological disease, n (%)	98 (5.0%)	16 (9.5%)	0.014
Immunodeficiency, n (%)	180 (9.3%)	18 (10.7%)	0.54
NEWS2 score	5 (3 - 8)	8 (6 - 10)	<0.001
Antibiotic therapy			
Prescribed at admission	1034 (53.2%)	119 (70.8%)	<0.001
During hospitalization	1175 (60.5%)	146 (86.9%)	<0.001
DOT	2 (0-5)	5 (2-9)	<0.001

Data are presented as median (IQR) for continuous measures, and n (%) for categorical measures.

RSV, Respiratory syncytial virus. SARS-CoV-2, Severe acute respiratory syndrome coronavirus-2. NEWS2, National Early Warning Score 2. DOT, Days of therapy.

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FIGURE 2



Keyword 1

Viruses and clinical virology

Keyword 2

Antibiotic stewardship (AMS)

Keyword 3

Respiratory viruses

Conflicts of interest

Do you have any conflicts of interest to declare?

No