ORIGINAL ARTICLE

DETERMINING THE PREVALENCE OF RESPIRATORY SYNCYTIAL VIRUS AND RISK FACTORS ASSOCIATED WITH SEVERE ILLNESS IN PATIENTS AGED ≥60 YEARS PRESENTING WITH SYMPTOMS OF ACUTE RESPIRATORY TRACT INFECTION

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Abstract

Introduction: This study aimed to determine the prevalence of respiratory syncytial virus and risk factors associated with severe infection in adults aged ≥60 years who presented with symptoms of acute respiratory tract infection and to obtain regional epidemiological data.

Materials and Method: The study was conducted on 230 patients aged ≥60 years who presented with symptoms of acute respiratory tract infection at the Manisa Celal Bayar University Emergency Department (n=130) and Pulmonology Outpatient Clinic (n=100) between January 1, 2024, and March 31, 2025. After obtaining informed consent from the patients, nasopharyngeal swab samples were collected and analyzed using the QIAstat-Dx Respiratory SARS-CoV-2 Panel. Demographic characteristics and potential risk factors were also recorded.

Results: At least one pathogen was detected in 44.8% of the patients, with respiratory syncytial virus (6.5%), influenza (16.1%), and rhinovirus/enterovirus (11.3%) being the three most commonly identified pathogens. Among patients with respiratory syncytial virus infection, cardiovascular diseases (53.3%) were the most common comorbidity, although no significant association was found between viral positivity and chronic diseases. The hospitalization rate for lower respiratory tract infections was highest among patients with respiratory syncytial virus (69.2%), whereas it was 56.0% among patients with influenza. No hospitalization was required for patients positive for SARS-CoV-2. Additionally, patients with respiratory syncytial virus had a higher incidence of hypoxia (p=0.035) and a greater need for intensive care unit admission (p=0.023).

Conclusion: Respiratory syncytial virus infections are associated with a more severe clinical course and an increased need for intensive care in older adults. Effective surveillance strategies for respiratory syncytial virus are required in Turkey.

Keywords: Aged; Respiratory Syncytial Virus; Respiratory Tract Infections; Risk Factors.

INTRODUCTION

Respiratory syncytial virus (RSV), once considered a childhood infection, is now reported to cause infections in all age groups, particularly resulting in severe disease in adults aged ≥60 years and in those with underlying chronic conditions (1). In the United States (US), it has been reported that between 60,000 and 120,000 older adults are hospitalized annually, and 6,000 to 10,000 die as a result of this infection (2,3). Additionally, it has been reported that between 1997 and 2009 in the US, influenza and RSV infections were associated with 28,000 and 17,000 cardiopulmonary deaths, respectively, among adults aged ≥65 years (4). A meta-analysis conducted in developed countries estimated the annual incidence of RSV-associated lower respiratory tract infections (LRTI) in adults aged ≥60 years at 1.62% and the in-hospital mortality rate at 7.13% (1). In another US-based study, 3–7% of healthy adults aged ≥65 years and 4–10% of high-risk adults with chronic heart or lung disease contracted RSV each year (5). Approximately 177,000 hospitalizations and 14,000 deaths due to RSV infection occur annually in this age group (5). According to the 2023 report from the Centers for Disease Control and Prevention, patients hospitalized with RSV were significantly more likely to require standard-flow oxygen therapy, high-flow nasal cannula, or noninvasive ventilation and to be admitted to the intensive care unit (ICU) than those hospitalized because of COVID-19 or influenza (6). These data highlight that RSV infections lead to serious clinical outcomes in older adults and those with underlying conditions, place a significant burden on healthcare systems, and underscore the need for vaccination in this age group (1,7).

As a result of clinical trials conducted in recent years, various vaccine candidates shown to be effective against RSV in individuals aged ≥60 years have been developed, and some have begun to be used in high-income countries (8). However, in low-income countries, access to vaccines, implementation strategies, and the definition of target groups remain significant challenges (8). Therefore, the Centers for Disease Control and Prevention recommend strengthening local epidemiological data and adopting risk-based approaches as prerequisites for establishing effective RSV immunization programs (8).

In Turkey, most studies related to RSV infections have focused on children, and data on the adult population are limited (9,10). In a few studies conducted on the detection of respiratory viral pathogens in adults, the prevalence of RSV ranged from 0.6% to 6.98% (11-14). However, a review of the current literature reveals that no epidemiological studies have been conducted in Turkey to investigate the prevalence of RSV infections in older adults with chronic diseases and their association with underlying risk factors. Regional epidemiological studies encompassing at-risk adult populations are needed to determine the true prevalence of RSV infections in Turkey and to develop effective prevention programs.

The aim of this study was to obtain epidemiological data that would contribute to determining the prevalence of RSV and the underlying risk factors associated with severe disease in patients aged ≥60 years presenting with acute respiratory tract infection (ARTI), as well as to help establish strategies for preventing these infections.

MATERIALS AND METHOD

This study was approved by the Health Sciences Ethics Committee of the Faculty of Medicine at Manisa Celal Bayar University (Date: January 31, 2024; Decision No: 20.478.486/2219). The study was conducted in accordance with the principles of the Declaration of Helsinki, and written informed consent was obtained from all participants prior to their inclusion in the study. The study was supported by the Scientific Research Projects Coordination Unit at Manisa Celal Bayar University (Project No: 2024-015).



Definition of the Study Population

The study population consisted of adults aged 60 and older who presented to the Emergency Department and the Pulmonology Outpatient Clinic at Manisa Celal Bayar University Hafsa Sultan Hospital with ARTI symptoms between January 1, 2024, and March 31, 2025.

The study included patients with a fever of 37.8 °C or higher or a history of fever, new or worsening cough, new or increased sputum production, new or worsening shortness of breath, sore throat, runny nose/nasal congestion, or fatigue/muscle pain (15,16).

Patients who presented with at least two of the specified symptoms and sought care at the Emergency Department or the Pulmonology Clinic during working hours were sequentially included in the study; patients were evaluated based on whether they received outpatient or inpatient care. Individuals under the age of 60 or those who did not exhibit at least two of the defined symptoms were excluded from the study.

Pre-prepared informed consent forms were read by patients who met the study criteria, and verbal and written consent was obtained from those who agreed to participate. Additionally, participants' demographic information and risk factors for respiratory tract infections were recorded using pre-prepared questionnaire forms. Questionnaires were administered by researchers through face-to-face interviews.

Sample Collection

After obtaining verbal and written consent from patients who met the study inclusion criteria, nasopharyngeal swab samples were collected from each patient.

Sterile Dacron-tipped, flexible-spiral, and aluminum-bodied thin swab sticks were used to collect nasopharyngeal swab samples. The swab was inserted through the nostrils into the anterior nasal cavity and gently advanced along the floor of the nasal cavity until it reached the pharyngeal wall. Once the pharyngeal wall was felt, the swab was rotated in a full circle for 5 s and then withdrawn. The collected samples were transported to the Medical Microbiology Molecular Laboratory at Manisa Celal Bayar University Hafsa Sultan Hospital in appropriate transport media.

Identification of Respiratory Pathogens

ARTI pathogens were identified using the QIAstat-Dx Respiratory SARS-CoV-2 Panel (Qiagen, Germany) on a QIAstat-Dx analyzer (Qiagen, Germany), a closed system, in accordance with the manufacturer's recommendations. The panel is a qualitative multiplex polymerase chain reaction-based test that analyzes nasopharyngeal swab samples collected from patients suspected of having respiratory tract infections for viral and bacterial nucleic acids. Detectable pathogens included: Influenza A, Influenza A subtype H1N1/2009, Influenza subtype H1, Influenza subtype H3, Influenza B, Coronavirus 229E, Coronavirus HKU1, Coronavirus NL63, Coronavirus OC43, SARS-CoV-2, Parainfluenza virus 1, Parainfluenza virus 2, Parainfluenza virus 3, Parainfluenza virus 4, RSV A/B, Human Metapneumovirus A/B, Adenovirus, Bocavirus, Rhinovirus/Enterovirus, *Mycoplasma pneumoniae*, *Legionella pneumophila*, *Bordetella pertussis*, and *Chlamydophila pneumoniae.*

Survey Data

Age, sex, occupation, smoking status, antibiotic use in the past 3 weeks, number of ARTI episodes in the past year, number of antibiotics used in the past year, hospital admission for respiratory-related conditions in the past year, vaccination status during the illness, and chronic diseases were assessed using a survey form.

For hospitalized patients, additional clinical information, such as hypoxia status, clinical and/or radiological evidence of lower respiratory tract involvement, need for ICU support, and/or

mechanical ventilation, was obtained from clinicians and the hospital information system.

The severity of RSV infections was determined based on clinical and/or radiological evidence of lower respiratory tract involvement, hospitalization, the need for intensive care, and the need for mechanical ventilation, and was evaluated in conjunction with other commonly identified viral pathogens.

Statistical Analysis

Within the scope of this study, survey data, clinical evaluation data, and polymerase chain reaction results of nasopharyngeal swab samples from 230 patients were recorded using IBM SPSS Statistics 27. Descriptive statistics were presented as mean ± standard deviation for the age variable and as the number of cases (n) and percentage (%) for categorical variables. Relations between categorical variables were assessed using Pearson's chi-square test. Results were considered statistically significant at $p<0.05$.

RESULTS

Within the scope of the study, 230 patients were included: 130 who presented to the Emergency Department of Manisa Celal Bayar University Hafsa Sultan Hospital and 100 who presented to the Pulmonology Outpatient Clinic. The mean age of the patients included in the study was 69.81 ± 8.19 years; 115 (50.0%) were women and 115 (50.0%) were men. It was found that 88.3% of the patients had at least one chronic disease, and the most commonly identified chronic diseases were those related to the cardiovascular system (62.2%), endocrine system (47.0%), and respiratory system (33.5%). Among the patients, 46.5% reported never having smoked, 33.9% reported quitting smoking, and 19.6% were currently smoking. While the vaccination rates for influenza (15.7%) and pneumococcal (3.9%) vaccines were quite low, 97.4% of the patients indicated that they had received at least one dose of the COVID-19 vaccine (Table 1).

Table 1. Sociodemographic Characteristics

Variable	Value
Age (mean ± SD)	69.81 ± 8.187
Sex	
Female	115 (50.0)
Male	115 (50.0)
Occupation	
Employed	37 (16.1)
Retired	98 (42.6)
Housewife	95 (41.3)
Smoking	
Current	45 (19.6)
Former	78 (33.9)
Never	107 (46.5)
Antibiotic use lasted 3 weeks	
Yes	90 (39.1)
No	140 (60.9)
Hospitalization last year	
Yes	43 (18.7)
No	187 (81.3)
Influenza vaccine	
Yearly	36 (15.7)
Never	183 (79.6)
Occasional	11 (4.8)
Pneumococcal vaccine	
Yes	9 (3.9)
No	221 (96.1)
COVID-19 vaccine	
Yes	224 (97.4)
No	6 (2.6)
Chronic disease	
Yes	203 (88.3)
No	27 (11.7)
Cardiovascular disease	143 (62.2)
Hypertension	123 (53.5)
Coronary artery disease	54 (23.5)
Congestive heart failure	8 (3.5)
Vasculitis	3 (1.3)
Endocrine diseases	108 (47.0)
Diabetes mellitus	94 (40.9)
Thyroid diseases	14 (6.1)
Respiratory diseases	77 (33.5)
COPD	43 (18.7)
Asthma	30 (13.0)
Interstitial lung disease	5 (2.2)
Malignancy	44 (19.1)



At least one pathogen was identified in 103 (44.8%) of the 230 patients included in the study; a single pathogen was detected in 98 (95.1%) patients and two pathogens were detected in five (4.9%) patients. The most frequently identified pathogens were influenza virus (16.1%), rhinovirus/enterovirus (11.3%), and RSV (6.5%; Table 2).

In the study population, 58 patients (25.2%) were clinically diagnosed with upper respiratory tract infection, and 172 patients (74.8%) were diagnosed with LRTI. The most common causative agents of LRTI were influenza virus (14.5%), rhinovirus/enterovirus (9.9%), and RSV (7.6%), while the most common causative agents of upper respiratory tract infection were influenza virus (20.7%), SARS-CoV-2 (15.5%), and rhinovirus/enterovirus (15.5%; Table 2).

The rate of hospitalization for LRTI treatment was significantly higher among individuals with a history of smoking than the rate among those who had never smoked. Similarly, the rate of hospitalization for LRTI was significantly higher among individuals who had used antibiotics in the past 3 weeks and those with a history of hospitalization for respiratory symptoms in the past year. Additionally, it was determined that the rate of hospitalization was significantly higher among individuals with chronic respiratory diseases (Table 3).

Table 2. Pathogen Distribution

Pathogen	Total n (%)	URTI n (%)	LRTI n (%)
Influenza A (other)	13 (5.7)	4 (6.9)	9 (5.2)
Influenza A H1N1	7 (3.0)	1 (1.7)	6 (3.5)
Influenza A H3	16 (7.0)	7 (12.1)	9 (5.2)
Influenza B	1 (0.4)	0 (0.0)	1 (0.6)
Coronavirus 229E	2 (0.9)	1 (1.7)	1 (0.6)
Coronavirus HKU1	0 (0.0)	0 (0.0)	0 (0.0)
Coronavirus NL63	2 (0.9)	1 (1.7)	1 (0.6)
Coronavirus OC43	2 (0.9)	1 (1.7)	1 (0.6)
SARS-CoV-2	11 (4.8)	9 (15.5)	2 (1.2)
Parainfluenza 1	3 (1.3)	1 (1.7)	2 (1.2)
Parainfluenza 2	2 (0.9)	2 (3.4)	0 (0.0)
Parainfluenza 3	3 (1.3)	0 (0.0)	3 (1.7)
Parainfluenza 4	0 (0.0)	0 (0.0)	0 (0.0)
RSV A/B	15 (6.5)	2 (3.4)	13 (7.6)
Human metapneumovirus	2 (0.9)	0 (0.0)	2 (1.2)
Adenovirus	0 (0.0)	0 (0.0)	0 (0.0)
Bocavirus	1 (0.4)	0 (0.0)	1 (0.6)
Rhinovirus/Enterovirus	26 (11.3)	9 (15.5)	17 (9.9)
Mycoplasma pneumoniae	1 (0.4)	0 (0.0)	1 (0.6)
Legionella pneumophila	0 (0.0)	0 (0.0)	0 (0.0)
Bordetella pertussis	1 (0.4)	0 (0.0)	1 (0.6)
Chlamydophila pneumoniae	0 (0.0)	0 (0.0)	0 (0.0)

Tablo 3. Risk factors for hospitalization in patients with LRTI

			LRTI		X^2
			Hospitalized	Outpatient	p
Smoking	Current	n	20	14	6.852
		%	20.0	19.4	0.033*
	Former	n	47	21	
		%	47.0	29.2	
	Never	n	33	37	
		%	33.0	51.4	
Antibiotic use (last 3 weeks)	Yes	n	56	21	12.190
		%	56.0	29.2	0.000*
	No	n	44	51	
		%	44.0	70.8	
Hospitalization (past year)	Yes	n	33	7	12.709
		%	33.0	9.7	0.000*
	No	n	67	65	
		%	67.0	90.3	
Respiratory disease	Yes	n	46	21	4.988
		%	46.0	29.2	0.026*
	No	n	54	51	
		%	54.0	70.8	
COPD	Yes	n	28	10	4.843
		%	28.0	13.9	0.028*
	No	n	72	62	
		%	72.0	86.1	

*p<0.05

A higher rate of RSV positivity was observed among individuals with a history of smoking and those who had used antibiotics in the past 3 weeks; however, this difference was not statistically significant. While 86.7% of patients positive for RSV had at least one chronic disease, the most common comorbidities were diseases related to the cardiovascular (53.3%), endocrine (46.7%), and respiratory systems (26.7%). However, no statistically significant association was found between RSV positivity and chronic diseases (Table 4).

The most commonly observed symptoms in the study population were cough (87.8%), fatigue/muscle pain (66.5%), sputum production (62.6%), and shortness of breath (57.8%). In patients positive for RSV, the most commonly observed symptoms were cough (100%), sputum production (86.7%), and shortness of breath (80.0%). An inverse correlation was observed between RSV positivity and fever (p=0.029), whereas a statistically significant association was observed between RSV positivity and the presence of phlegm (p=0.046). Influenza positivity was associated with fatigue/muscle pain (p=0.015). SARS-CoV-2 positivity was found to be significantly associated with the presence of fever (p=0.004) and sore throat (p=0.009) and with the

Tablo 4. Association of common pathogens with sociodemographic characteristics and risk factors

			RSV		X^2	Influenza viruses		X^2	SARS- CoV-2		X^2	Rhinovirus/ Enterovirus		X^2
			Positive	Negative	p	Positive	Negative	p	Positive	Negative	p	Positive	Negative	p
Smoking	Current	n	3	42	0.324	8	37	3.052	3	42	1.354	3	42	1.308
		%	20.0	19.5	0.851	21.6	19.2	0.217	27.3	19.2	0.508	11.5	20.6	0.520
	Former	n	6	72		8	70		2	76		9	69	
		%	40.0	33.5		21.6	36.3		18.2	34.7		34.6	33.8	
	Never	n	6	101		21	86		6	101		14	93	
		%	40.0	47.0		56.8	44.6		54.5	46.1		53.8	45.6	
Antibiotic use (last 3 weeks)	Yes	n	7	83	0.383	11	79	1.636	4	86	0.037	4	86	6.940
		%	46.7	38.6	0.536	29.7	40.9	0.201	36.4	39.3	0.847	15.4	42.2	0.008*
	No	n	8	132		26	114		7	133		22	118	
		%	53.3	61.4		70.3	59.1		63.6	60.7		84.6	57.8	
Chronic disease	Yes	n	13	190	0.039	31	172	0.853	10	193	0.078	23	180	0.001
		%	86.7	88.4	0.843	83.8	89.1	0.356	90.9	88.1	0.780	88.5	88.2	0.973
	No	n	2	25		6	21		1	26		3	24	
		%	13.3	11.6		16.2	10.9		9.1	11.9		11.5	11.8	
Cardiovascular disease	Yes	n	8	135	0.533	22	121	0.138	7	136	0.011	14	129	0.864
		%	53.3	62.8	0.465	59.5	62.7	0.710	63.6	62.1	0.918	53.8	63.2	0.353
	No	n	7	80		15	72		4	83		12	75	
		%	46.7	37.2		40.5	37.3		36.4	37.9		46.2	36.8	
Respiratory disease	Yes	n	4	73	0.334	12	65	0.022	3	74	0.200	5	72	2.672
		%	26.7	34.0	0.563	32.4	33.7	0.883	27.3	33.8	0.655	19.2	35.3	0.102
	Yok	n	11	142		25	128		8	145		21	132	
		%	73.3	66.0		67.6	66.3		72.7	66.2		80.8	64.7	

*p<0.05

Tablo 5. Symptoms and clinical characteristics of RSV, Influenza, SARS-CoV-2, and Rhinovirus/Enterovirus infections

			RSV		X^2	Influenza viruses		X^2	SARS- CoV-2		X^2	Rhinovirus/ Enterovirus		X^2
			Positive	Negative	p	Positive	Negative	p	Positive	Negative	p	Positive	Negative	p
Fever	Yes	n	2	90	4.755	16	76	0.193	9	83	8,418	9	83	0.354
		%	13.3	41.9	0.029*	43.2	39.4	0.660	81.8	37.9	0.004*	34.6	40.7	0.552
	No	n	13	125		21	117		2	136		17	121	
		%	86.7	58.1		56.8	60.6		18.2	62.1		65.4	59.3	
Cough	Yes	n	15	187	2.224	33	169	0.077	7	195	6.322	24	178	0.551
		%	100.0	87.0	0.136	89.2	87.6	0.782	63.6	89.0	0.012*	92.3	87.3	0.458
	No	n	0	28		4	24		4	24		2	26	
		%	0.0	13.0		10.8	12.4		36.4	11.0		7.7	12.7	
Sputum	Yes	n	13	131	3.967	18	126	3.671	2	142	9.740	15	129	0.303
		%	86.7	60.9	0.046*	48.6	65.3	0.055	18.2	64.8	0.002*	57.7	63.2	0.582
	No	n	2	84		19	67		9	77		11	75	
		%	13.3	39.1		51.4	34.7		81.8	35.2		42.3	36.8	
Dyspnea	Yes	n	12	121	3.235	17	116	2.552	1	132	11.251	13	120	0.736
		%	80.0	56.3	0.072	45.9	60.1	0.110	9.1	60.3	0.000*	50.0	58.8	0.391
	No	n	3	94		20	77		10	87		13	84	
		%	20.0	43.7		54.1	39.9		90.9	39.7		50.0	41.2	
Sore throat	Yes	n	3	49	0.062	10	42	0.492	6	46	6.734	8	44	1.116
		%	20.0	22.8	0.803	27.0	21.8	0.483	54.5	21.0	0.009*	30.8	21.6	0.291
	No	n	12	166		27	151		5	173		18	160	
		%	80.0	77.2		73.0	78.2		45.5	79.0		69.2	78.4	
Rhinorrhea	Yes	n	4	26	2.626	5	25	0.009	3	27	2.062	7	23	4.979
		%	26.7	12.1	0.105	13.5	13.0	0.926	27.3	12.3	0.151	26.9	11.3	0.026*
	No	n	11	189		32	168		8	192		19	181	
		%	73.3	87.9		86.5	87.0		72.7	87.7		73.1	88.7	
Myalgia	Yes	n	12	141	1.309	31	122	5.900	7	146	0.043	19	134	0.566
		%	80.0	65.6	0.253	83.8	63.2	0.015*	63.6	66.7	0.835	73.1	65.7	0.452
	No	n	3	74		6	71		4	73		7	70	
		%	20.0	34.4		16.2	36.8		36.4	33.3		26.9	34.3	
LRTI	Yes	n	13	159	1.202	25	147	1.217	2	170	19.625	17	155	1.373
		%	86.7	74.0	0.273	67.6	76.2	0.270	18.2	77.6	0.000*	65.4	76.0	0.241
	No	n	2	56		12	46		9	49		9	49	
		%	13.3	26.0		32.4	23.8		81.8	22.4		34.6	24.0	
Hospitalization	Yes	n	9	91	0.711	14	86	0.055	0	100	2.810	8	92	0.952
		%	69.2	57.2	0.399	56.0	58.5	0.815	0.0	58.8	0.094	47.1	59.4	0.329
	No	n	4	68		11	61		2	70		9	63	
		%	30.8	42.8		44.0	41.5		100.0	41.2		52.9	40.6	
Hypoxia	Yes	n	8	47	4.455	14	41	13.045	0	55	-	5	50	0.170
		%	88.9	52.2	0.035*	100.0	48.2	0.000*	0.0	55.6		62.5	54.9	0.680
	No	n	1	43		0	44		0	44		3	41	
		%	11.1	47.8		0.0	51.8		0.0	44.4		37.5	45.1	
ICU admission	Yes	n	4	13	5.177	2	15	0.095	0	17	-	2	15	0.375
		%	44.4	14.4	0.023*	14.3	17.6	0.757	0.0	17.2		25.0	16.5	0.540
	No	n	5	77		12	70		0	82		6	76	
		%	55.6	85.6		85.7	82.4		0.0	82.8		75.0	83.5	
Requirement for mechanical ventilation	Yes	n	2	7	2.066	0	9	1.631	0	9	-	1	8	0.122
		%	22.2	7.8	0.151	0.0	10.6	0.202	0.0	9.1		12.5	8.8	0.726
	No	n	7	83		14	76		0	90		7	83	
		%	77.8	92.2		100.0	89.4		0.0	90.9		87.5	91.2	

*p<0.05

absence of cough (p=0.012), sputum (p=0.002), and shortness of breath (p<0.001). A significant association was also found between rhinovirus/enterovirus positivity and the presence of nasal discharge (p=0.026; Table 5).

While 86.7% of patients positive for RSV were clinically diagnosed with LRTI, 69.2% were hospitalized for treatment. In patients positive for influenza, these rates were slightly lower, without a statistically significant difference, with an LRTI diagnosis rate of 67.6% and a hospitalization rate of 56.0%. Among patients with SARS-CoV-2, only 18.2% exhibited ARTI symptoms, and none required hospitalization. Among patients positive for rhinovirus/enterovirus, the hospitalization rate for LRTI was 47.1%. However, the incidence of hypoxia (p=0.035) and need for intensive care (p=0.023) were significantly high in patients positive for RSV (Table 5).

DISCUSSION

Although RSV vaccines are recommended for older adults and individuals with chronic illnesses in some countries, information regarding the prevalence and clinical effects of RSV infection in this risk group is limited in our country (8). In our country, in the few studies reporting RSV prevalence in adults, the prevalence was 4.0% by Sirin and 6.98% by Kuskucu et al. (11,12). When examining more recent studies, an Ankara-based study covering the 2022–2024 period reported an RSV incidence of 2.3% in adults (13). In another study conducted in Edirne between April 2023 and April 2024 that evaluated respiratory samples from 764 patients aged 18 years and older, SARS-CoV-2 had the highest positivity rate at 18.6%, whereas RSV was detected in only two patients (0.6%), with the patients' ages reported as 34 and 88 (14). However, all of these studies included an adult population aged 18 years and older, and no study in the literature has been identified that examines the prevalence and disease burden of RSV in adults aged 60 years and older in Turkey.

In a pioneering study conducted in the US in the early 2000s—one of the earliest studies in this field—by Falsey et al., the prevalence and clinical effects of RSV infection were evaluated in adults with and without chronic heart or lung disease over four consecutive winter seasons (15). In the study, the RSV incidence was reported as 7.6% in healthy adults aged 65 years and older, while this rate increased to 10.3% in individuals with chronic cardiopulmonary disease (15). In this study, however, the prevalence of RSV in individuals aged 60 years and older was found to be 6.5%, and no significant difference in RSV prevalence was observed between individuals with and without chronic disease. This finding is thought to stem from the fact that the vast majority (88.3%) of the patients included in the study had at least one chronic disease.

In a recent meta-analysis, the most commonly reported symptoms associated with RSV infection in older adults were coughing (86.0%), fatigue/weakness (86.7%), shortness of breath (72.3%), and sputum production (56.1%) (17). In this study, cough was observed in all RSV-positive patients (100%), sputum was recorded as a concomitant symptom in 86.7% of cases, and shortness of breath was noted in 80.0% of cases. Additionally, while an inverse correlation was observed between RSV positivity and high fever (p=0.029), a statistically significant correlation was observed between RSV positivity and sputum production (p=0.046). Similarly, Recto et al. reported that shortness of breath was one of the most common symptoms, whereas high fever was the least frequently reported symptom (18). Ambrosch et al. reported that cough was the most common symptom of RSV infection, whereas fever was detected less frequently (19). Therefore, in older adults and those with chronic illnesses, RSV infection should be considered if fever is not accompanied by symptoms, such as cough, sputum production, and shortness of breath.

In this study, we included individuals with a history of smoking (p=0.003), those who had used

antibiotics in the past 3 weeks (p=0.003), and those with a history of hospitalization for respiratory symptoms in the past year (p=0.002). Similarly, Chen et al. reported that smoking significantly increased the risk of ARTI, particularly LRTI (20). A US-based retrospective cohort study reported that patients with a history of respiratory-related hospitalization within the past year were at high risk of developing LRTI in the subsequent period (21). Consistent with our findings, Kim et al. reported an increased incidence of LRTI in older adults with a history of antibiotic use (22). These findings indicate that early diagnosis and close clinical monitoring should be prioritized in older patients with risk factors for LRTI development.

In this study, 86.7% of RSV-positive patients were diagnosed with ARTI, and approximately two-thirds (69.2%) were hospitalized for treatment of ARTI. The hospitalization rate among influenza-positive patients was 56.0%, and although no statistically significant difference was detected, the incidence of RSV-associated LRTI and the hospitalization rate were higher. Similarly, Recto et al. reported that hospitalization rates were significantly higher in RSV-positive patients than in influenza-positive patients (RSV, 83.2%; influenza, 70.0%; p=0.003) (18). Similarly, in a recent meta-analysis, an estimated 27.44% (95% CI: 18.74–38.29) of older individuals diagnosed with RSV developed LRTI, 24.48% (95% CI: 0.43–96.07) were hospitalized, and 5.01% (95% CI: 0.47–37.36) required ICU support (17). In the same study, it was reported that 32.82% (95% CI: 23.49–43.74) of high-risk patients were hospitalized, and 26.74% (95% CI: 20.40–34.22) required ICU support (17). In our study, while only 14.3% of the influenza-positive patients requiring hospitalization required ICU support, this rate increased to 44.4% among RSV-positive patients. Hypoxia developed in 88.9% of the patients hospitalized because of RSV; of these, 50.0% received nasal oxygen therapy, 25.0% received noninvasive ventilation, and 25.0% received mechanical ventilation. The incidence of hypoxia (p=0.035) and need for ICU admission (p=0.023) were significantly high in RSV-positive patients. Similarly, Recto et al. reported that ICU admission rates were higher in RSV-positive patients than in influenza-positive patients (RSV, 7.2%; influenza, 3.0%; p=0.034) (18). However, Ambrosch et al. reported that the need for ICU admission and mechanical ventilation in RSV-positive patients was higher than that in both Influenza A (OR=1.69; p=0.020 and OR=1.59; p=0.050) and Influenza B (OR=1.98; p=0.018 and OR=2.33; p<0.001, respectively) (19).

However, our study did not find any statistically significant differences in RSV prevalence, hospitalization rates, or the need for intensive care between older adults with and without chronic diseases. It is thought that this may be related to the inability to achieve numerical balance between the groups due to the fact that the vast majority of the study population had at least one chronic disease, and consequently, the limited statistical power. Another limitation of our study is that long-term clinical outcomes, such as mortality rates, duration of mechanical ventilation, and length of hospital stay, were not evaluated. Therefore, further studies are needed that evaluate elderly individuals with and without chronic diseases in separate and balanced groups, include long-term follow-up data, and have a larger sample size.

In conclusion, when the findings of this study are evaluated in conjunction with the relevant literature, they support the notion that RSV infections are a significant cause of morbidity in older adults. Although no statistical differences were observed in RSV prevalence or clinical outcomes between patients with and without chronic conditions, the findings suggest that RSV infections may present with a more severe clinical course than influenza infections and are associated with a higher need for ICU admission. Accordingly, each country should develop effective and sustainable protection strategies that primarily target at-risk groups based on their own epidemiological data and healthcare infrastructure.



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