


# SARS-CoV-2 Infection in Health Care Workers: Cross-sectional Analysis of an Otolaryngology Unit

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## Abstract

The restart of routine in- and outpatient activity in the COVID-19 postepidemic peak needs to be carefully planned in light of specific patterns of viral diffusion. We evaluated SARS-CoV-2 serology in the entire personnel of a COVID-19-free otolaryngology department in a highly affected area. The aim was to determine the prevalence of SARS-CoV-2 positivity among staff to clarify the impact of different risk factors for infection. The entire staff of the otolaryngology unit was tested for SARS-CoV-2 serology. Symptomatic staff members were tested with nasal/pharyngeal swabs. All answered a survey focused on the number of in- and extrahospital positive contacts and type of activities in the unit. Five (9%) were positive for SARS-CoV-2 infection. The only variable associated with a higher risk of infection was the number of extrahospital contacts without personal protective equipment ( $P = .008$ ). Our study shows that in non-COVID-19 departments, the use of adequate personal protective equipment leads to low rates of infection among health care workers. The prevalent risk of infection was related to extrahospital contact.

## Keywords

COVID-19, coronavirus, SARS-CoV-2, otolaryngology, infection, hospital

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The restart of routine in- and outpatient activity in the COVID-19 postepidemic peak will need to be carefully planned and monitored in light of specific patterns of viral diffusion. The rate of SARS-CoV-2 infection among health care workers in otolaryngology departments not directly involved in the management of COVID-19 cases, though still at high risk for dealing with the superior aerodigestive tract, should be examined to provide evidence-based data to characterize different sources of infection.

We evaluated SARS-CoV-2 serology in the entire personnel of a COVID-19-free department in a referral institution of a highly affected area in Northern Italy. The aim was to determine the prevalence of SARS-CoV-2 positivity among

staff to clarify the impact of in- and extrahospital positive contacts and to identify those who are potentially at an increased risk of infection.

## Methods

A cross-sectional study evaluating infection risk profiles for SARS-CoV-2 in hospital personnel was performed in an otolaryngology unit in a high-prevalence area. The typical workload was significantly reduced according to national guidelines. Only oncologic/urgent patients had access to the outpatient clinic, inpatient facility, and operator room.

The entire staff of the otolaryngology unit at the University of Brescia was tested for SARS-CoV-2 serology with a SARS-CoV-2 IgG chemiluminescent microparticle immunoassay (DiaSorin). Symptomatic staff members were tested with nasal/pharyngeal swabs to evaluate SARS-CoV-2 infection by real-time polymerase chain reaction. Positive cases were defined as those with positive IgG serology and/or positive nasal/pharyngeal swab. All staff members answered a survey focused on the number of in- and extrahospital positive contacts and the prevalent type of activities in the unit. Personnel transferred to dedicated COVID-19 units were excluded from the study. Comparisons were performed by chi-square, Fisher exact, and Wilcoxon-Mann-Whitney tests as appropriate. All participants signed an informed consent form approved by the institutional review board. The study was performed following the principles of the Declaration of Helsinki and was approved by the Research Review Board, Ethics Committee, of the ASST Spedali Civili of Brescia (NP4037).

## Results

All personnel ( $N = 58$ ; mean age, 41 years; male:female ratio, 1:1.9) provided access to their medical records and

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**Table 1.** Contacts With Infected Patients Among Personnel of the Otolaryngology Unit.<sup>a</sup>

No. of contacts	Inhospital		Extrahospital	
	With PPE	Without PPE	With PPE	Without PPE
0	4 (7)	38 (66)	55 (95)	50 (86)
1	7 (12)	13 (22)	2 (3)	7 (12)
2 or 3	28 (48)	3 (5)	1 (2)	1 (2)
4 or 5	9 (16)	4 (7)	0	0
>5	10 (17)	0	0	0

Abbreviation: PPE, personal protective equipment.

<sup>a</sup>Values are presented as No. (%).

answered the survey-based questionnaire. Of these, 5 (9%) were positive for SARS-CoV-2 infection. One worker was completely asymptomatic (positive serology and negative swab); 2 had nonspecific symptoms without fever (positive serology and negative swab in both); and 2 were symptomatic (positive serology in 1, positive swab in 2). The symptomatic participant with negative serology had a positive swab 29 days before serology and 2 consecutive negative swabs at 19 and 15 days before the blood test.

The role and type of activity (ie, secretary, inpatient, outpatient, operating room) were not associated with different rates of infection. In contrast, the only variable associated with a higher risk of infection was the number of extrahospital contacts without personal protective equipment (PPE;  $P = .008$ ; **Table 1**).

## Discussion

Hospital-associated transmission of SARS-CoV-2 has a pivotal role in the maintenance of the epidemic and is a significant issue for health care workers around the world.<sup>1</sup> This factor remains a critical problem even in the postemergency phase, when specific infection control measures should be instituted to allow routine activity in non-COVID-19 departments while limiting the risk of generating new clusters of infection. Serology tests may help to provide a broader picture of SARS-CoV-2 diffusion and estimation of the rate of infection in specific settings.<sup>2</sup> Our study shows that in non-COVID-19 departments, the use of adequate PPE leads to low rates of infection among health care workers. In

particular, the prevalent risk of infection was related to extrahospital contact, in which interactions are likely to be closer and more prolonged and the use of PPE less cautious.

## Author Contributions

**Alberto Paderno**, study design, drafting of the manuscript, revision of the manuscript, final approval, final agreement; **Milena Fior**, study design, drafting of the manuscript, final approval, final agreement; **Giulia Berretti**, study design, drafting of the manuscript, final approval, final agreement; **Alberto Schreiber**, study design, drafting of the manuscript, final approval, final agreement; **Alberto Grammatica**, study design, drafting of the manuscript, final approval, final agreement; **Davide Mattavelli**, study design, drafting of the manuscript, final approval, final agreement; **Alberto Deganello**, study design, drafting of the manuscript, revision of the manuscript, final approval, final agreement.

## Disclosures

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