SARS-CoV-2 infection in healthcare workers: cross-sectional analysis of an Otolaryngology Unit

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Abstract

The restart of routine inpatient and outpatient activity in the COVID-19 post-epidemic 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 clarifying the impact of different risk factors for infection.

The entire staff of the Unit of Otolaryngology was tested for SARS-CoV-2 serology. Symptomatic subjects were tested with nasal/pharyngeal swabs. All subjects answered a survey focused on the number of in- and extra-hospital positive contacts, and type of activities in the Unit.

Five (9%) subjects were positive for SARS-CoV-2 infection. The only variable associated with a higher risk of infection was the number of extra-hospital contacts without personal protective equipment (PPE) (p=0.008).

Our study shows that in non-COVID-19 departments, the use of adequate PPE leads to low rates of infection among healthcare workers. The prevalent risk of infection was related to extra-hospital contact.
Introduction

The restart of routine inpatient and outpatient activity in the COVID-19 post-epidemic 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 healthcare workers in otolaryngology departments not directly involved in the management of COVID-19 patients, but still at high-risk since 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, clarifying the impact of in-hospital and extra-hospital positive contacts, and identifying subjects 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 operatory room.

The entire staff of the Unit of Otolaryngology, University of Brescia, was tested for SARS-CoV-2 serology with the LIAISON SARS-CoV-2 S1/S2 IgG chemiluminescent microparticle immunoassay (DiaSorin, Saluggia, Italy). Symptomatic subjects were tested with nasal/pharyngeal swabs evaluating 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 subjects answered a survey focused on the number of in- and extra-hospital positive contacts, and prevalent type of activities in the Unit. Personnel transferred to dedicated COVID-19 Units were excluded from the study. Comparisons were performed by the Chi-squared, Fisher exact, and Wilcoxon-Mann-
Whitney tests as appropriate. All subjects 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; M:F ratio, 1:1.9) provided access to their medical records and compiled the survey-based questionnaire. Of these, five (9%) were positive for SARS-CoV-2 infection. One worker was completely asymptomatic (positive serology and negative swab), 2 had non-specific symptoms without fever (positive serology and negative swab in both), and 2 were symptomatic (positive serology in 1, positive swab in 2). The symptomatic subject with negative serology had a positive swab 29 days before serology and two consecutive negative swabs at 19 and 15 days before the blood test.

The role and type of activity (i.e., 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 extra-hospital contacts without personal protective equipment (PPE) (p=0.008) (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 healthcare workers around the world. This factor remains a critical issue even in the post-emergency 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. Our study shows that in non-COVID-19 departments, the use of adequate PPE leads to low rates of infection among
healthcare workers. In particular, the prevalent risk of infection was related to extra-hospital contact, with whom interactions are likely to be closer and more prolonged and use of PPE less cautious.

REFERENCES


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**Table 1.** Description of the type of contacts with infected subjects among personnel of the Otolaryngology Unit.