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COVID-19 in healthcare workers at the Olot Regional Hospital (Girona)[☆]

Hospital comarcal de Olot (Girona)

Dear Director,

Spain is the country with the most healthcare professionals (HP) affected by the coronavirus 2019 disease (COVID-19) in the world. A report from April 2020 by the European Centre for Disease Prevention and Control notes that 20% of COVID-19 cases in Spain affected this group whereas in Italy, the percentage was 10% and in the United States of America and China, it was 3% and 3.8%, respectively.¹ As of May 14, 2020, a total of 236,611 COVID-19 cases had been reported to the National Epidemiological Surveillance Network, of which 39,349 corresponded to HP.²

An observational, prospective study was performed on COVID-19 infections among HP at the Olot Regional Hospital of La Garrtxa (ORHG), a regional hospital in Girona with 136 hospitalization beds in 4 units: units 3 and 4 (U3/U4) with 64 beds for acute patients, and units 1 and 2 (U1/U2) with 72 beds for chronic/community healthcare. U3 was isolated and destined exclusively for the care of COVID-19 patients.

All HP in the hospital were included in the study; only those who did not provide consent were excluded. In a first period (starting on March 11, 2020, when the first case of COVID-19 was diagnosed in the hospital), all HP with symptoms were attended to in the Occupational Health Department in order to diagnose COVID-19. In a second period (starting April 21, 2020, when the last COVID-19 cases were diagnosed in HP), a PCR test was given to HP who did not present with symptoms or who tested negative in the first period.

To diagnose COVID-19, confirmation by means of a positive PCR test for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in nasopharyngeal smear samples was required. For the serologic tests, capillary blood sam-

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¹ In Appendix A the remaining members of the COCOHMAT (Cohort Covid of the Hospital de Mataró) group are listed.

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ples were used (rapid detection of SARS-CoV-2 antibodies by means of immunochromatography).

The Ethics Committee of the Dr. Josep Trueta University Hospital of Girona approved the study and informed consent was obtained from all participants.

Of a total of 493 HP, 198 (40.1%) consulted with the Occupational Health Department. Of those, 81 (16.4% of the staff) were diagnosed with COVID-19 (Table 1). The majority were women (median age of 43 years) in professional categories in direct contact with patients, particularly nurses and nursing aides, and most (52%) worked in U1/U2 (chronic/community healthcare). The majority of HP consulted for respiratory symptoms, but they also presented with other symptoms (the most frequent were headache and abnormalities in taste or smell). Three HP required hospital admission due to pneumonia, one of which required treatment in the ICU with intubation and mechanical ventilation. Progress was favorable in all cases. The majority had a negative PCR test at 14 days, but in nearly a third, it took 21, 28, or up to 35 days for them to test negative.

The second period included 412 HP: 117 who had symptoms during the first period but had a negative PCR test and 295 who did not have symptoms. Seventy-seven could not or did not want to participate in the study and the remaining 345 underwent PCR and serologic tests. 100% of the PCR tests were negative and in 28 cases (8.1%), the serologic tests were positive (6 cases for IgM, 11 cases for IgG, and 11 cases for both).

The majority of the HP affected by COVID-19 were women, with a median age of 43 years, a characteristic similar to the few COVID-19 series in HP reported in other countries such as the United States of America,^{3,4} China,⁵ and Holland.⁶ As in these series, the majority presented with respiratory symptoms. Furthermore, a non-negligible proportion of cases also experienced other symptoms, such as headache or digestive abnormalities.^{4,6} 53% of cases reported abnormalities in taste or smell. This percentage is much higher than in other series on HP with COVID-19 (7%–16%),^{4,6} but is similar to the rate found in a study on the prevalence of these symptoms in mild cases of COVID-19.⁷

The majority of cases were mild and there was only one ICU admission. Nevertheless, the mortality rate due to COVID-19 in HP reported to date is 49 cases in

[☆] Please cite this article as: Trullàs JC, Vilardell I, Blasco M, Heredia J. COVID-19 en treballadors sanitaris del Hospital comarcal de Olot (Girona). *Rev Clin Esp.* 2020;220:529–531.

Table 1 Characteristics of the 81 healthcare workers affected by COVID-19 in the Olot Hospital.

Variable	
Female sex, n (%)	73 (90.1)
Age (median [IQR]; range)	43 [21]; 18–63
Professional category according to risk, n (%)	
(A) Direct contact with patients	69 (85.2)
(B) No direct contact but at risk	5 (6.2)
(C) No contact and no risk	7 (8.6)
Professional category n (%)	
Physician (A)	8 (9.9)
Nurse (A)	26 (32.1)
Nursing Aide (A)	30 (37.0)
Cleaning Staff (B)	5 (6.2)
Administrative Staff (C)	4 (4.9)
Others (A and C) ^a	8 (9.9)
Usual place of work, n (%)	
Unit 1	19 (23.5)
Unit 2	17 (21.0)
Units 1 and 2	6 (7.4)
Unit 3	4 (4.9)
Unit 4	7 (8.6)
Offices	8 (9.9)
Emergency Department	5 (6.2)
Multiple locations	7 (8.6)
Others ^b	8 (9.9)
Symptoms, n (%)	
Headache	46 (56.8)
Dizziness	22 (27.2)
Peripheral vertigo	6 (7.4)
Vomiting and/or diarrhea	14 (17.3)
Abnormalities in taste or smell	43 (53.1)
Dermatological symptoms ^c	7 (8.6)
Ocular symptoms (conjunctivitis)	5 (6.2)
Upper respiratory tract infection	77 (95.1)
Pneumonia	4 (4.9)
Hospital admission for pneumonia (one in the ICU), n (%)	3 (3.7)
Treatment, n (%)	
Hydroxychloroquine + azithromycin ^d	6 (7.4)
Darunavir/cobicistat ^e	1 (1.2)
Time to negative SARS-CoV-2 PCR test, n (%)	
14 days	56 (69.1)
21 days	12 (14.8)
28 days	12 (14.8)
35 days	1 (1.2)

PCR: polymerase chain reaction; IQR: interquartile range; ICU: Intensive Care Unit.

^a Category A (direct contact) includes: porter (2), physical therapist (1), psychologist (1), social worker (1). Category C (no contact and no risk) includes: cafeteria worker (1), kitchen worker (1), hospital lawyer (1).

^b Includes: Operating Theater (3), Outpatient Clinics (2), Kitchen (2), Rehabilitation (1).

^c Six skin rashes and one case of macular erythema.

^d Indication: hydroxychloroquine 400 mg/12 h for one day followed by 200 mg/12 h for 4 more days; azithromycin 500 mg/24 h for one day followed by 250 mg/24 h for 4 more days.

^e In the context of a clinical trial.

Spain,² 27 cases in the United States,⁴ and 23 cases in China.⁸

In our opinion, many cases of COVID-19 in HP were transmitted within the hospital (nosocomial transmission). Like in other series,⁹ the majority worked in direct contact with patients (85.2%) and especially in community health units (U1/U2) in which isolation measures were implemented later than those implemented early in U3 (COVID-19 unit) and the Emergency Department, which had fewer transmissions. Therefore, it is probable that the majority of cases in HP were transmitted before stricter isolation measures were implemented.

The time until a PCR test yields a negative result is a limitation to the reincorporation of HP to their jobs. In our study, more than 80% had a negative PCR test at 21 days, which is in line with epidemiological studies that have reported a median of 20 days for a negative result on this test. However, in some cases, it can take much longer.^{10,11} Seroconversion in our study was higher to that found in the population of Spain (5.0%) and of Girona province (2.5%),¹² but much lower than what has been observed in other centers (from 17% to 44%).^{13,14}

In conclusion, 16.4% of HP in our hospital were affected by COVID-19 and 8.1% of those who did not have the disease (at least symptomatically) presented with seroconversion. It is likely that if stricter isolation measures had been implemented early in all units, the number of transmissions would have been lower.

Acknowledgments

To Zoetis Laboratories, Vall de Bianya (Girona) for their invaluable, generous help in performing the healthcare professionals' PCR tests.

References

1. Coronavirus disease 2019 (COVID-19) in the EU/EEA and the UK – ninth update, 23 April 2020. Stockholm: ECDC; 2020.
2. Informe sobre la situación de COVID-19 en personal sanitario en España a 14 de mayo de 2020. Equipo COVID-19. RENAVE. CNE. CNM (ISCIII).
3. Chow EJ, Schwartz NG, Tobolowsky FA, Zacks RLT, Huntington-Frazier M, Reddy SC, et al. Symptom screening at illness onset of health care personnel with SARS-CoV-2 infection in King County, Washington. *JAMA*. 2020;323:2087–9, doi:10.1001/jama.2020.6637.
4. CDC COVID-19 Response Team. Characteristics of Health Care Personnel with COVID-19 - United States, February 12–April 9, 2020. *MMWR Morb Mortal Wkly Rep*. 2020;69:477–81, doi:10.15585/mmwr.mm6915e6.
5. Wei XS, Wang XR, Zhang JC, Wei-Bing Y, Wan-Li M, Bo-Han Y, et al. A cluster of health care workers with COVID-19 pneumonia caused by SARS-CoV-2 [published online ahead of print, 2020 Apr 27]. *J Microbiol Immunol Infect*. 2020, doi:10.1016/j.jmii.2020.04.013.

6. Kluytmans M, Buiting A, Pas S, Bentvelsen R, van den Bijllaardt W, van Oudheusden A, et al. SARS-CoV-2 infection in 86 health-care workers in two Dutch hospitals in March 2020. medRxiv. 2020, doi:10.1101/2020.03.23.20041913.
7. Spinato G, Fabbri C, Polesel J, Cazzador D, Borsetto D, Hopkins C, et al. Alterations in smell or taste in mildly symptomatic outpatients with SARS-CoV-2 infection. JAMA. 2020;323:2089–90, doi:10.1001/jama.2020.6771.
8. Zhan M, Qin Y, Xue X, Zhu S. Death from Covid-19 of 23 Health Care Workers in China. N Engl J Med. 2020;382:2267–8, doi:10.1056/NEJMc2005696.
9. Hunter E, Price DA, Murphy E, van der Loeff IS, Baker KF, Lendremet D, et al. First experience of COVID-19 screening of health-care workers in England. Lancet. 2020;395:e77–78, doi:10.1016/S0140-6736(20)30970-3.
10. Zhou F, Yu T, Du R, Fan G, Liu Y, Liuet Z, et al. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. Lancet. 2020;395:1054–62, doi:10.1016/S0140-6736(20)30566-3.
11. European Centre for Disease Prevention and Control. Guidance for discharge and ending isolation in the context of widespread community transmission of COVID-19, 8 April 2020. Stockholm: ECDC; 2020.
12. Estudio ENE-COVID19: primera ronda. Estudio nacional de seroepidemiología de la infección por SARS-CoV-2 en España. Informe preliminar 13 de mayo de 2020.
13. Shields AM, Faustini SE, Perez-Toledo M, Jossi S, Aldera EL, Allen JD, et al. SARS-CoV-2 seroconversion in health care workers. medRxiv. 2020, doi:10.1101/2020.05.18.20105197.
14. Hains DS, Schwaderer AL, Carroll AE, Starr MC, Wilson AC, Amanat F, et al. Asymptomatic Seroconversion of Immunoglobulins to SARS-CoV-2 in a Pediatric Dialysis Unit. JAMA. 2020;323:2424–5, doi:10.1001/jama.2020.8438.

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Necrotizing tracheobronchitis with endotracheal tube obstruction in COVID-19 patients[☆]



Traqueobronquitis necrosante con obstrucción del tubo endotraqueal en pacientes COVID-19

Dear Director,

COVID-19 is an infection caused by the SARS-CoV-2 virus that can cause severe or fatal complications in high-risk patients. Though rare, we have observed several cases of necrotizing tracheobronchitis, which causes airway obstruction, with necrotic and hemorrhagic debris that obstruct the trachea and bronchi.

This problem has already been described in infections caused by the H1N1 flu virus, bacterial infections, and diseases such as rheumatoid arthritis or ulcerative colitis. It is associated with the formation of bronchial blood clots, bronchial hypersecretion, and presence of bacte-

rial lung infection.^{1,2} Said clots provoke severe obstruction of the bronchial lumen, leading to an increase in airway pressure and making ventilation impossible. In many cases, it is necessary to exchange the endotracheal tube urgently.

This complication, which we believe may influence a patient's prognosis, entails an increase in risk of contagion by healthcare personnel; it is one of the procedures classified as of greatest risk for viral transmission from patients to healthcare personnel, along with bronchoscopy, aerosol therapy, nebulization, and aspiration of secretions. The aim of our study is to analyze the prognosis of patients with COVID-19 who have undergone an episode of endotracheal tube obstruction that made exchanging it necessary.

During the period from February to April 2020, 26 patients were hospitalized in our ICU: 22 (84.7%) required invasive mechanical ventilation (Table 1). Of those, 16 (72.7%) presented with at least one episode of endotracheal tube obstruction that required an exchange. What's more, none of these incidents occurred before the seventh day mechanical ventilation, with a mean day of onset of 10.5 days. Some patients even required a tube exchange on more than one occasion. The mean number of exchanges was 1.46.

If we compare patients who had endotracheal tube obstruction and tube exchange (which we will group

[☆] Please cite this article as: Pérez Acosta G, Santana-Cabrera L. Traqueobronquitis necrosante con obstrucción del tubo endotraqueal en pacientes COVID-19. Rev Clin Esp. 2020;220:531–533.