Crisis and Resilience

Journal Homepage: https://journals.explorerpress.com/cr

Case

A New and Rapid Way to Diagnose Covid-19 Infection Early on Board a Cruise Ship

Salducci Mauro

Medical Clinic Manager in Forensic Ophthalmology, Department of Sense Organs, Sapienza University of Rome. Viale del Policlinico, 155, 00161, Rome, Italy

KEYWORDS

COVID-19

Ship

Conjunctivitis

ABSTRACT

Little is known about the Covid-19 transmission through ocular tissue, and more research needs to be carried out in order to confirm its ability to infect ocular tissue and its pathogenic mechanisms. Covid- 19 may be detected in the tears and conjunctival secretions in novel coronavirus pneumonia patients with conjunctivitis.This case report shows a severe viral conjunctivitis in a patient dia- gnosed with Covid-19 on the Diamond Princess ship, characterized by both red, irritated and swollen eyes, with transparent serous secretions, conjunctival chemosis, pseudomembranes of fibrin and inflammatory cells on the tarsal conjunctiva accompanied by preauricular lymph nodes and enlarged submaxillaries.

*CORRESPONDING AUTHOR

Department of Sense Organs Sapienza University of Rome Piazzale Aldo Moro 5 – 00185 Rome, Italy; Email: mauro.salducci@uniroma1.it

ARTICLE INFO

Received: 25 August 2025 | Revised: 8 August 2025 | Accepted: 9 September 2025 | Published Online: 10 September 2025

DOI: https://doi.org/10.65773/cr.1.1.8

COPYRIGHT

Copyright © 2025 by the author(s). Published by Explorer Press Ltd. This is an open access article under the Creative Commons Attribution 4.0 International (CC BY 4.0) License (https://creativecommons.org/licenses/by/4.0)

1. Introduction

COVID-19 is the current name of the viral agent respon- sible for the serious specific syndrome that has circulated around the world with the popular definition of CORO-NAVIRUS. This is the history of the

coronavirus that first spread in China in December 2019, quickly becoming a serious problem worldwide with high mortality from acute respiratory failure and the need for quarantine, sinking the economy of the countries involved and limiting the travel for both business and tourism. It is a real emergency for doctors. Personal protective equipment is always necessary for the care of COVID-19 according to guidelines based on the recommendations for the coronavirus SARS and MERS. Current data show a mortality rate of around 2 to 4 percent. About 20 percent of infected patients required critical intensive care [1-2].

As can be seen from the attached bibliography, Chinese colleagues Wang and collaborators reported a series of 138 patients hospitalized with coronavirus-infected pneumonia (2019-nCoV) with an average age of 56 years and 54.3% were men. The disease is transmitted by droplets from respiratory secretions (Flugge drops) loaded with viruses from an infected person that reach the nose, eyes or mouth of another and from there the lungs. Common symptoms included fever, fatigue and dry cough. Laboratory tests showed lymphopenia, prolonged prothrombin time and elevated lactate dehydrogenase. The computed tomogra- phic scans on the chest showed bilateral irregular shadows or frosted glass opacities in the lungs of all patients. Most patients received antiviral therapy (oseltamivir) and many received antibacterial therapy (moxifloxacin or ceftriaxone or azithromycin) and glucocorticoid therapy. 26% of patients were transferred to the intensive care unit (ICU) due to complications such as acute respiratory distress syndrome, arrhythmia and shock and needed ventilatory assistance. The ICU patients, generally compared to the other patients, were older (median age, 66 years versus 51 years) and affected by underlying comorbidities [3-4].

Little is known about the Covid-19 transmission through ocular tissue, and more research needs to be carried out in order to confirm its ability to infect ocular tissue and its pathogenic mechanisms [5-6]. Xia and coll. Argue that Covid-19 may be detected in the tears and conjunctival secretions in novel coronavirus pneumonia patients with conjunctivitis [4].

Here we examine the case of a positive Italian COVID-19 patient, 72 years old with type 2 diabetes mellitus, treated with metformin, and with high blood pressure treated with specific drugs, all in a discrete clinical and pharmacological framework. His 66-year-old wife was in good general health. Both retirees used to travel but in the final phase of the cruise on the Diamond Princess ship it was discovered that some passengers had been exposed and infected by Covid-19. Like others who underwent oropharyngeal and nasal swab (throat and nose) PCR testing, the asymptomatic husband was positive and the wife negative. By order of the health authorities and the captain, all passengers were placed in quarantine, with the obligation to remain in their cabins we- aring the simple surgical mask. Their request for separation from each other was not accepted due to the unavailability of free cabins. The couple, therefore, for several days in a restricted environment had to follow scrupulous attention. Not having the opportunity to communicate directly with other friends, not speaking English, not receiving certain information on the evolution of the epidemic and what to do, both experienced an anxiety condition, which gradually degenerated into panic crisis. So the situation was as follows: in her husband, although asymptomatic, the discomfort of having a potentially lethal infection and of being able to be a source of contagion for his wife was prevalent; the psychological stress of impotence was present in the wife, combined with the objective risk of being infected in turn; in both, the persistent condition of "isolation", of lack of news and uncertainty about the near future has led to a condition of anxiety and panic. The patient's condition was good and only conjunctivitis had been diagnosed. In fact, the symptoms included irritation, photophobia and aqueous secretion in both eyes. So these, from 03.02.2020 made their first quarantine in the cabin assigned to them [7-8].

2. Discussion

The repatriation mission of European citizens decided by our Ministry of Foreign Affairs on 18.02.2020, coordinated by the Civil Protection has been entrusted to the Ministry of Defense (Igesan for medical aspects – Italian Air Force for transport) and Ministry of Health for aspects of epide- miological control.

Task Force composed of:

-Staff of the Scientific Department of the Celio Military Hospital in Rome (Col. Lista Florigio, Head of the Department, immunologist, as well as 1 laboratory doctor, 1 biologist, 2 nurses), with the task of performing swabs on site, using special equipment brought in from Italy and obviously suitable to perform the test with PCR method.

-2 doctors from the Spallanzani hospital in Rome, with the task of verifying the medical aspects of repatriation:

-1 psychiatrist doctor (Col. Izzo Simeone, from IMAS of Rome), with the task of giving psychological support to some passengers in difficulty.

The population to be examined was composed of:

- passengers of the ship, Italian but also belonging to EU countries, who had expressed their willingness to be repatriated by a dedicated flight (21 pax), already subjected to a swab by the Japanese Health Authorities on 08.02.2020. Of these only 1, 72 year old Italian, M.T. he had tested positive.
- crew, of the ship composed of Italians and belonging to the EU (17 pax). None of these had previously been swabbed.

Mission started on 18.02.2020, at 23.00 Italian time. Arrive in Tokyo on 19 at 22.30.

Testing started on board the Diamond Princess ship on the morning of 20.02.2020. End of withdrawals in the afternoon. Results at 11 pm. Among these: 1 new positive (crew member, of Montenegrin nationality), confirmed the Italian case.

Consequently, on 22.02.2020 the protected transport was organized by bus at Tokyo airport, where in the meantime the Boeing of the Italian Air Force had arrived, specially equipped for the controlled transport of passengers in Europe (with a stopover in Berlin, for the release of German / Dutch / Slovenian / Romanian passengers) and final in Pratica di Mare for the remaining, plus 2 Greeks.

The positive Italian, on the other hand, was transported by the Japanese authorities to their quarantine / treatment hospital. The same, asymptomatic from the first test with the exception of the ocular problem focused here, was di- scharged on 05.03.2020, after verification of 2 consecutive negative tests after 24 hours. Returned to Italy with sche- duled flight on 06.03.2020. The wife, negative both to the first text made on 08.02.2020 by the Japanese and to our event on 20.02.2020, returned with our dedicated military flight. Negative, like all the others, to the subsequent tests made at the Cecchignola in Rome in the due subsequent quarantine period [9-10].

This lucky case was therefore asymptomatic with the exception of severe viral conjunctivitis characterized by both red, irritated and swollen eyes, with transparent se- rous secretions, conjunctival chemosis, pseudomembranes of fibrin and inflammatory cells on the tarsal conjunctiva accompanied by preauricular lymph nodes and enlarged submaxillaries. The topical therapy prescribed on board consisted of applying a cold compress on the closed eyelids for 5-10 minutes, 3-4 times a day, artificial tears without preservatives applied several times a day and a local antiviral gel based on ganciclovir 5 times per day for 7 days with the complete resolution of ocular symptoms to clinical objectivity already during the stay on the ship Diamond Princess.

5. Conclusion

Several clinical reports suggest that this virus can also cause acute conjunctivitis, especially in the prodromal stages of the disease, probably transmitted by direct contact of the infected aerosol (Flugge drops) with the conjunctiva of the subject until then free from pathology, such as it probably happened in our clinical case [11-12].

In fact, it is no coincidence that Ophthalmologists have proven to be often the first Doctors useful for evaluating patients possibly infected with COVID-19 [5], unfortunately with the danger of being in turn infected during the execution of the eye examination, as it actually is happened for example in the first weeks of an emergency in China. In conclusion, we agree with Lai and coll [6]. That ophthalmologists need work closely with local infection control teams to implement infection control measures that are appropriate for their own clinical settings.

Funding

This research received no external funding.

Data Availability

Data supporting reported results can be found in the links to publicly archived datasets analyzed.

Conflicts of Interest

The authors declare no conflict of interest.

Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

References

[1] Messineo D, Massaro F, Izzo P, Milani A, Polimeni R, Iannella G, Marinozzi S, Consorti F, Cocuzza S, Maniaci A, Mucchino A, Nannarelli M, Greco A, Magliulo G, Salducci M, Pace A. Radiomic Application for Head and Neck Squamocellular Tumor: Systematic Review. Clin Ter. 2024 Mar-Apr;175(2):153-160. PMID: 38571474. https://doi.org/10.7417/CT.2024.5048

[2] Taffon C, Naciu AM, Bonfiglio R, Palumbo V, Maricchiolo G, Morano V, Salducci M, Stigliano S, Palermo A, Di Matteo FM, Crescenzi A. From sampling to cellblock: The fully automated journey of cytological specimens. Diagn Cytopathol. 2024 Nov;52(11):611-616. Epub 2024 Jun 6. PMID: 38842251. https://doi.org/10.1002/dc.25366

[3] Bodini S, Pieralice S, D'Onofrio L, Mignogna C, Coraggio L, Amendolara R, Risi R, Salducci M, Buzzetti R, Maddaloni E. No Differences in Kidney Function Decline Between People With Type 2 Diabetes Starting a Sodium-Glucose Cotransporter 2 Inhibitor or a Glucagon-like Peptide-1 Receptor Agonist: A Real-world Retrospective Comparative Observational Study. Clin Ther. 2024 Nov;46(11):828-834. Epub 2024 Jul 4. PMID: 38964935. https://doi.org/10.1016/j.clinthera.2024.04.009

[4] Salducci M, Shaholli D. Video display terminal use and limitations according to italian legislative decree: occupational and forensic perspective. Clin Ter. 2023 Sep-Oct;174(5):444-455. PMID: 37674455. https://doi.org/10.7417/CT.2023.2463

[5] Salducci M, Pacella F, Malvasi M, Messineo D, Comberiati AM, Pacella E. Medico legal considerations on refractive surgery. Clin Ter. 2020 Nov-Dec;171(6):e476-e480. PMID: 33151244. https://doi.org/10.7417/CT.2020.2260
[6] Shahbaz R, Salducci M. Law and order of modern ophthalmology: Teleophthalmology, smartphones legal and ethics. Eur J Ophthalmol. 2021 Jan;31(1):13-21. Epub 2020 Jun 14. PMID: 32544988. https://doi.org/10.1177/1120672120934405
[7] Iannucci V, Bruscolini A, Iannella G, Visioli G, Alisi L, Salducci M, Greco A, Lambiase A. Olfactory Dysfunction and Glaucoma. Biomedicines. 2024 May 2;12(5):1002. PMID: 38790964; PMCID: PMC11117544. https://doi.org/10.3390/biomedicines12051002
[8] Gioia G, Salducci M. Medical and legal aspects of telemedicine in ophthalmology. Rom J Ophthalmol. 2019 Jul-Sep;63(3):197-207. PMID: 31687620; PMCID: PMC6820487. https://doi.org/10.22336/rjo.2019.31
[9] Salducci M, Shaholli D. Historical evolution of the passenger ship's doctor. Med Leg J. 2024 Jun;92(2):96-98. Epub 2024 Mar 5. PMID: 38441057. https://doi.org/10.1177/00258172231223046
[10] Salducci M, Raimondi R, Simonelli MS. Medico legal study on the correct management of the medical clinic in the military field. Clin Ter. 2025 Jul-Aug;176(4):512-514. PMID: 40728340. https://doi.org/10.7417/CT.2025.5256
[11] Salducci M. Preventive use of eye drops to stabilize the tear film in video display terminal workers: preliminary notes. Clin Ter. 2023 Nov-Dec;174(6):483-485. PMID: 38048109. https://doi.org/10.7417/CT.2023.5013
[12] Salducci M, Deandri A. Medical legal validity of the use of the anomaloscope in the dyschromatopsia of aspiring civil and military aircraft pilots. Rom J Ophthalmol. 2020 Apr-Jun;64(2):153-157. PMID: 32685781; PMCID: PMC7339684. https://doi.org/10.22336/rjo.2020.27