FIRST CASE OF COVID-19 IN BADUNG REGENCY: A LESSON FROM INDONESIAN CRUISE SHIP WORKER

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ABSTRACT

Introduction: Coronavirus Disease 2019 (COVID-19) is an outbreak of respiratory illness later proved caused by a novel coronavirus, Severe Acute Respiratory Syndrome Coronavirus -2 (SARS-CoV-2), first notified in Wuhan. COVID-19 was then known to spread from China to other parts of the world rapidly. Travel-related transmissions, especially via cruise ships, were identified in many countries, including Indonesia. Bali is a major Indonesian tourist destination with its first case of COVID-19, who was a cruise ship worker and classified as an imported case. Case report: A 23-year-old Balinese male cruise ship worker visited Europe 2 weeks prior to hospital admission. He came with shortness of breath, sore throat, dry cough, fatigue for 3 days and fever for 9 days. Physical examination revealed fever with normal blood pressure, pulse rate, and respiratory rate. Blood saturation (SpO2) of 98% with oxygen nasal cannula 2 L/min. The rapid screening test for COVID-19 was reactive and confirmed by nasopharyngeal swabs rRT-PCR. Chest X-ray revealed bilateral perihilar and pericardial haziness. He was subsequently given empirical antibiotics with azithromycin, chloroquine, oseltamivir, vitamin C and antitussive agents. He was discharged with good recovery on the 21st day after two consecutive negative swab examination results. Conclusion: In our case, we highlighted cruise-ship workers as a vulnerable population in COVID-19 transmission. Travel history information is important for the clinician to identify or suspect COVID-19 cases.

KEYWORDS COVID-19, Cruise Ship Worker, First case, Transmission

Introduction

World Health Organization (WHO) announced an outbreak of respiratory illness in late December 2019 caused by SARS-CoV-2, later officially named Coronavirus Disease 2019 (COVID-19). This virus was considered the third zoonotic human coronavirus of the century.[1] First notified in Wuhan,[2] SARS-CoV-2 pre-dominantly infects lower respiratory tracts, binding to ACE2 receptors on alveolar epithelial cells.[3,4]

COVID-19 then rapidly spreads from China to other parts of the world with more than 3.5 million confirmed cases, tending to an increase daily worldwide. Transmission may occur anywhere, especially in confined spaces such as cruise ships leading to super spreading transmission.[5] Travel-related transmission was identified in many countries through international conveyance, raising a global health emergency.[1]

On February 3, 2020, an outbreak of COVID-19 was reported on Diamond Princess Cruise Ship off the Japanese coast, causing the ship to be quarantined by the local authority. The number has since ballooned to be the largest COVID-19 outbreak outside of Mainland China.[6] Cruise ships carry a large number of people packed in confined spaces with a relatively longer time than other modes of transportation.[6] Therefore, presenting...
On March 25, 2020, a 23-year-old male Balinese cruise ship worker was transferred to Udayana University Hospital as a patient suspected of COVID-19. The chief complaint includes shortness of breath, sore throat, dry cough, fatigue for 3 days, and fever for 9 days. His condition was getting worse during hospitalization. Initial physical examination revealed a body temperature of 37.9°C, blood pressure of 110/70 mm Hg, a pulse of 88 bpm, respiratory rate of 20 breaths/min, and SpO2 of 98% with nasal cannula 2 L/min. The breathing sound was initially normal. Further laboratory examination showed lymphopenia (531 cells/µl), elevated levels of aspartate aminotransferase (AST, 78 U/L), normal levels of alanine aminotransferase (ALT, 41 U/L), C-reactive protein within the normal limit (CRP, 7.8 mg/L), and mildly elevated lactate dehydrogenase (LDH, 295 U/L). Serology test for COVID-19 was reactive and confirmed positive by Real-Time Reverse-Transcriptase Polymerase Chain Reaction (rRT-PCR) for SARS-CoV-2 from his nasopharyngeal swab. The chest X-ray revealed bilateral perihilar and pericardial infiltration and haziness (Figure 1).

He worked at a cruise ship as a waiter, but he did not wear a mask or facial protection during his work even though he was aware of this pandemic. His cruise ship had sailed through France, Malta, and Italy, before arriving at Barcelona on March 12, 2020, as its final destination. He spent a day in Barcelona sightseeing at a market near the harbour with his friends before flying back to Bali via Qatar (Figure 2).

The patient was then given empirical antibiotics such as azithromycin, chloroquine, oseltamivir, vitamin C, and antiviral agents on his first day of hospitalization. We added chloroquine and antiviral agents on day 2 based on the standard of care of our hospital after the positive rRT-PCR result. The test was then repeated on day seven, showing a negative result. However, on day 10, the test came out positive. Before getting discharged, his nasopharyngeal swabs on days 19 and 21 were negative, respectively. The patient’s clinical condition soon improved, and he was discharged 21 days following his admission (April 15, 2020).

Serial chest X-ray examination was done and its revealed remission in both lung field (Figure 2.B) that we confirmed these findings with thoracic CT scan (Figure 3).

Discussion
Clinical manifestation of COVID-19 varies from asymptomatic, mild, moderate, to severe, with main symptoms of fever, cough, shortness of breath and fatigue. The mild-moderate form may be atypical in the early course of COVID-19 that indistinguishable from many other common infectious diseases.[9] In more severe cases, infections caused viral pneumonia and could lead to severe acute respiratory distress syndrome (ARDS) and even death.[10] The worsening inflammatory-induced lung injury will create a decrease in oxygen saturation (<93%). From this point on, that there may be a rapid deterioration of respiratory functions.[11]

According to the Diagnosis and Treatment Guideline for SARS-CoV-2 issued by the Chinese National Health Committee, this patient is categorized as a moderate-levelled case of pneumonia COVID-19.[10] The transmission of COVID-19 was thought to solely occur from animal to humans[12] in Huanan Seafood Wholesale Market of Wuhan,[11] only to finally know that this pandemic progressed, human-to-human transmission is also taking place through respiratory droplets[11] and direct contact.[13] Parametric analysis shows that the growth rate of COVID-19 is about twice that of the SARS and MERS. The COVID-19 doubling cycle is two to three days, suggesting that the number of COVID-19 patients would double in two to three days without human intervention.[14] Frequent overcrowding in a confined environment such as on a cruise ship may increase the risk for infection. Ships provide an isolated, crowded environment with poor ventilation that may increase the passenger’s risk of infection if exposed to respiratory viruses.[5]
The mean of the incubation period for COVID-19 is 6 days, varying from 2-11 (95% CI) days [15]. This may explain the transmission time in our case, i.e. probably happened while he was at the ship or during embarking in Barcelona.

There are four stages of COVID-19 radiology findings: Early-stage on day 0-4, progressive stage on day 5-8, peak stage on day 9-14, and finally absorption stage on >14 days, correlated with clinical course. [16] Radiology findings were also affected by the disease severity. In mild cases, x-ray findings could be normal or only shows minimal patchy infiltration on the lung field. This correlates to our patient’s x-ray finding on day 6, with only minimal haziness on the bilateral perihilar region. Even though several studies had already reported the sensitivity finding of chest CT scan to evaluate the typical radiographic features in most COVID-19 patients, we did not perform a chest CT scan examination immediately after admission because we are trying to reduce the mobility of the patient in our hospital to lower the risk of transmission to our medical staffs. Instead, after the patient recovers and his rRT-PCR result proves him negative of COVID-19, we did a CT evaluation to ensure any abnormal sequel presence on the patient lung. It then showed up as a CT result of a normal lung.

The gold standard for SARS-CoV-2 detection is conducted through rRT-PCR assays from nasal and oropharyngeal swabs. Though results from RT-quantitative PCR could be affected by variations in viral RNA sequences or viral loads in different anatomic sites during the disease’s natural course, an estimate shows false-negative rates (FNRs) from one-time testing would occur in 30% to 50% cases of real COVID-19. [17]

There are several comorbidities such as hypertension, diabetes mellitus, and cardiac diseases that can increase the severity of COVID-19 symptoms. [18,19] In addition, immunosuppressive conditions because of chronic fatigue, alcohol consumption, and sleep problems might be a risk factor in our case. Further studies indicate that detectable SARS-CoV-2 in the blood is a strong indicator for further clinical severity (p-value = 0.0001) and may even replicate in the digestive tract. [20]

There is no specific treatment for COVID-19, although different experimental treatments with antiviral drugs (lopinavir/ritonavir; remdesivir) and interferon are being used. [21] Therefore, we recommend administering hydroxychloroquine (HCQ) (or chloroquine/ QC) on a case-by-case basis for patients with COVID-19 with evidence for pneumonia because of the in vitro activity of HCQ/QC against SARS-CoV-2, with hydroxychloroquine being more potent than the latter. Chloroquine had been reported to be superior in preventing pneumonia, improving lung imaging findings, hastening conversion to a virus-negative state, and shortening the duration of disease. [11] Adverse effects profiles of HCQ/QC are well established, too. Therefore, patients could be monitored for predictable adverse effects with routine tests.

Quarantine, physical distancing, and early detection with the rapid diagnostic assay of cruise ship workers could help prevent and control the spreading of covid-19 infection from these workers. Because little is known about its transmission method, it is well recommended to take precautions if SARS-CoV-2 may transmit by airborne measures.

**Conclusion**

Early diagnosis of COVID-19 is important for the clinician that allows early patient’s isolation, ensuing laboratory confirmation of SARS-CoV-2, and appropriate further management. This case report emphasizes the importance of recognizing and tracing a patient’s travel history and possible exposure to infected contacts in order to do an early identification and isolation of patients at risk of high-risk transmissible disease.

**Funding**

This work did not receive any grant from funding agencies in the public, commercial, or not-for-profit sectors.

**Conflict of interest**

There are no conflicts of interest to declare by any of the authors of this study.

**References**

1. Gralinski LE, Menachery VD. Return of the coronavirus: 2019-nCoV. Viruses. 2020.
2. World Health Organization. Novel Coronavirus Situation Report - 28 [Internet]. World Health Organization. 2020 [cited 2020 Feb 28]. Available from: https://www.who.int/docs/default-source/coronovirus/situation-reports/20200427-sitrep-98-covid-19.pdf?sfvrsn=90323472_4
3. Guzzi PH, Mercatelli D, Ceraolo C, Giorgi FM. Master Regulator Analysis of the SARS-CoV-2/Human Interactome. J Clin Med. 2020;
4. CUSABIO TECHNOLOGY LLC. ACE2, The Hottest Target of SARS-CoV-2 Invasion [Internet]. 2020 [cited 2020 May 11]. Available from: https://www.cusabio.com/c-20982.html
5. Minooee A, Rickman LS. Infectious Diseases on Cruise Ships. Clin Infect Dis. 1999;29(4):737-43.
6. Rocklöv J, Sjödin H, Wilder-Smith A. COVID-19 outbreak on the Diamond Princess cruise ship: estimating the epidemic potential and effectiveness of public health countermeasures. J Travel Med. 2020;
7. Anton M, Asmara T, Sepe B. Indonesia Announces First COVID Death, as WHO Calls Outbreak a Pandemic [Internet]. Available from: https://www.benarnews.org/english/news/indonesian/coronavirus-031120152558.html
8. Karnaedi Y. Ribuan Naker Kapal Pesiar Asal Bali Dipulangkan Pascawabah COVID-19, Puluhan Ribu Orang Dikhawatirkan Bernasib Sama [Internet]. Available from: http://www.balipost.com/news/2020/03/18/110284/Ribuan-Naker-Kapal-Pesiar-Asal..html
9. Holshue ML, DeBolt C, Lindquist S, Lofy KH, Wiesman J, Bruce H, et al. First case of 2019 novel coronavirus in the United States. N Engl J Med. 2020;382(10):929–36.
10. Lovato A, de Filippis C. Clinical Presentation of COVID-19: A Systematic Review Focusing on Upper Airway Symptoms. Ear Nose Throat J. 2020;
11. Cascella M, Rajnik M, Cuomo A, Dulebohn SC, Di Napoli R. Features, Evaluation and Treatment Coronavirus (COVID-19). StatPearls. 2020.
12. Rothan HA, Byrareddy SN. The epidemiology and pathogenesis of coronavirus disease (COVID-19) outbreak. Journal of Autoimmunity. 2020.

13. Lai CC, Shih TP, Ko WC, Tang HJ, Hsueh PR. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and coronavirus disease-2019 (COVID-19): The epidemic and the challenges. International Journal of Antimicrobial Agents. 2020.

14. Liang K. Mathematical model of infection kinetics and its analysis for COVID-19, SARS and MERS. Infect Genet Evol. 2020;

15. Backer JA, Klinkenberg D, Wallinga J. Incubation period of 2019 novel coronavirus (2019- nCoV) infections among travellers from Wuhan, China, 20-28 January 2020. Eurosurveillance. 2020.

16. Pan F, Ye T, Sun P, Gui S, Liang B, Li L, et al. Time Course of Lung Changes On Chest CT During Recovery From 2019 Novel Coronavirus (COVID-19) Pneumonia. Radiology. 2020;

17. Wang Y, Kang H, Liu X, Tong Z. Combination of RT-qPCR testing and clinical features for diagnosis of COVID-19 facilitates management of SARS-CoV-2 outbreak. Journal of Medical Virology. 2020.

18. Hussain A, Bhowmik B, do Vale Moreira NC. COVID-19 and diabetes: Knowledge in progress. Diabetes Research and Clinical Practice. 2020.

19. Fang L, Karakiulakis G, Roth M. Are patients with hypertension and diabetes mellitus at increased risk for COVID-19 infection? The Lancet Respiratory Medicine. 2020.

20. Chen W, Lan Y, Yuan X, Deng X, Li Y, Cai X, et al. Detectable 2019-nCoV viral RNA in blood is a strong indicator for the further clinical severity. Emerging Microbes and Infections. 2020.

21. Cao Y chen, Deng Q xin, Dai S xue. Remdesivir for severe acute respiratory syndrome coronavirus 2 causing COVID-19: An evaluation of the evidence. Travel Medicine and Infectious Disease. 2020.