Changing Trends of Covid-19 Treatment and Early Use of Antibiotics: A Case in Pakistan

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Abstract

Coronavirus disease 2019, caused by severe acute respiratory syndrome coronavirus 2, was declared a global pandemic by the World Health Organization in March 2020. A cluster of unexplained pneumonia cases linked to the Huanan seafood market in Wuhan, China was first reported on December 31, 2019. After testing negative for common respiratory viruses, these patients tested positive for a novel coronavirus - severe acute respiratory syndrome-related coronavirus 2 (SARS-CoV-2), which is the cause of coronavirus disease 2019 (COVID-19). Some of these initial patients demonstrated hypoxemia, ground glass opacification on chest imaging, abnormal laboratory results - low white blood cell (WBC) count, low absolute lymphocyte count (ALC), low platelet count, elevated liver enzymes, and elevated creatinine. COVID-19 was declared a global pandemic by the World Health Organization with over 23,697,273 confirmed cases in over 200 countries and territories as of August 26, 2020. Pakistan is among the few countries which were initially hit hard but have had a remarkable recovery, with the cases falling from 4000+ per day in March to only 400+ cases in the current month. As of August 26, 2020, 278,939 cases out of a total of 294,139 positive cases have recovered. However, according to a local study 15000 doctors and paramedics were tested for COVID 19 antibodies and 32% were found to be positive, indicating the extent to which healthcare professionals have been affected and several have lost their lives.

Keywords: Covid-19 in Pakistan, SARS-Cov2, Pandemic 2020

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Case presentation

We report a case of a previously healthy 26-year-old Pakistani lady, who is a doctor in a public hospital and was diagnosed with coronavirus disease at a Punjab Teaching Hospital. Her clinical course was notable for intermittent low grade fever, nonproductive cough, relatively decreased lymphocyte count and progressive dyspnea with normal oxygen saturation at room air and infiltrates on chest imaging which warranted the empirical use of antibiotics early in the disease course. Our patient recovered and was discharged after 2 consecutive negative RT-PCR for COVID-19 after 21 days of hospitalization. This case highlights our patient’s clinical course, including diagnostic work-up, medical management and early use of antibiotics in preventing disease progression.

Discussion

A 26-year-old unmarried Pakistani lady working as a doctor in a makeshift isolation center within a teaching hospital for past 1 month in Punjab, Pakistan, where she cared for suspected COVID-19 patients. While caring for these patients, she reported wearing personal protective equipment (PPE) regularly. However, she followed the protocols of donning and doffing to a limited extent. A few reasons for this were lack of proper donning and doffing areas and inadequate modes of communication with the outside staff. There were also no negative pressure rooms or adequate ventilation in the facility where she was working.

She presented to our institution with a 3-days history of intermittent low grade fever which was relieved by taking paracetamol, along with nausea and nonproductive cough. She isolated herself in a room at her home as soon as the symptoms started. Three days later she had worsening of her cough and developed new onset mild dyspnea which was insidious in onset, progressive and aggravated by climbing stairs. However there was no history of any central chest pain, palpitations, orthopnea, Paroxysmal Nocturnal Dyspnea (PND). There was also no complaint of unilateral leg swelling or pleuritic chest pain. There were no urinary symptoms or body swelling and no symptoms of Systemic Lupus Erythematosus (SLE) or other rheumatologic diseases. She had no significant past medical, surgical or drug history apart from paracetamol and no allergic history. Apart from her workplace she did not travel within or outside the country and did not visit any congested public places within the last 1 month. She was living with 3 other family members including her parents and 1 brother. None of them had any symptoms or any history of COVID-19 infection.

She was rushed to ER of our hospital where her vital signs were: pulse rate of 80 beats per minute (regular), blood pressure of 110/70 mmHg, respiratory rate was 20 per minute and she was maintaining 94% Oxygen saturation at room air, her temperature was 98 degrees Fahrenheit. There were no signs of dehydration and the rest of general physical examination was unremarkable.

Her nasopharyngeal (NP) and oropharyngeal (OP) swabs for COVID-19 using reverse transcription polymerase chain reaction (RT-PCR) were taken as per recommended guidelines. Her blood tests including Complete Blood Count (CBC), Liver Function Test (LFTs), Renal Function Tests (RFT), Serum Electrolytes (S/E) and coagulation studies were sent immediately. ECG showed normal Sinus Tachycardia. Laboratory studies were notable (figure 1 and 2) for WBCs at 7 (range 4-11), granulocytes at 47% (range 50-75%), relative lymphopenia with lymphocytes 17% (range 20 to 50%), neutrophils at 71 (range 40-75%), anemia with hemoglobin of 10.1 (range 12-16), and low hematocrit 31.9 (range 36 to 32). Other test results including liver function tests, renal function test and coagulation studies were unremarkable. A chest X-ray (CXR) demonstrated (Figure 3) minimal infiltrates in right peripheral lower lung zones. An initial differential diagnosis of lobar pneumonia/COVID-19 was made. Patient was empirically given Levofloxacin to treat suspected bacterial infection of lungs. Treatment was largely supportive during this time, comprising of oral hydration, antipyretic therapy and an antihistamine drug.

During days 1–5 of hospitalization, she experienced only non-productive cough with dyspnea at rest but maintained SpO2 between 94% to 98% at room air along with decreased appetite and nausea. RT-PCR report came back on day 2 which was positive for COVID-19. On day 3 her laboratory reports were notable for increasing lymphocytes 42% (range 20 to 50) and decreasing neutrophils at 59 (range 40-75).

On day 6, she had developed diarrhea most probably due to antibiotic for which metronidazole was started along with oral rehydration and her diarrhea settled over the next 3 days. Patient’s lab reports were improving and so was her dyspnea. By day 14 her SpO2 was 98-99% and respiratory rate of 12 breaths per minute (normal). During this whole time she never required oxygen as she was maintaining SpO2 of 94-98% at room air.

On 14th and 15th day since the start of symptoms, her nasopharyngeal (NP) and oropharyngeal (OP) swabs were sent again for RT-PCR and the reports came back to be negative. She was discharged and sent home. She remained asymptomatic on her online follow up visit 1 week later.

Our case helps offer insight into the variation in clinical course of COVID-19 patients. Coronavirus disease is thought to be transmitted from person to person by respiratory droplets and direct contact (Lai CC, 2020). As she was working as a doctor in isolation center, it is likely that she contracted COVID-19 at the workplace as symptom onset was 4 days after her last known patient contact. The incubation period of COVID-19 is estimated to be between 2 and 14 days (summary., 2020) (Linton NM, 2020) (Lauer SA, 2020).Contributing to this transmission of infection were the lack of proper donning and doffing areas, improper isolation facilities and inadequate training of paramedical staff in the center. These short falls might explain the high infection rate in health care professionals in Pakistan (News, 2020).

However, a proper audit is required to assess the short
Comings of the isolation centers and the level of training of the staff.

Similar to the first documented cohort of COVID-19 patients linked to the Huanan seafood market, our patient had relative lymphopenia, which recovered during the course of her illness (Huang C, 2020). She notably had WBCs on the lower range on hospital day 3, which also recovered. Chest imaging findings were also significant for infiltrates. In contrast to the reported cohort, (Huang C, 2020) liver function and renal function in this patient remained normal during the disease course.

The clinical improvement in our patient coincided with the early initiation of Levofloxacin on day 1 of hospitalization, since fluoroquinolones have been hypothesized to have anti-viral effect as well (Irene Karampelaa, 2020). However, it is unclear if this improvement can be attributed to the drug and/or to the natural course of COVID-19 infection. Thus, further extended studies are required to determine the role of these agents in treating COVID-19 infection.

CDC-guided NP and OP samples of our patient which were sent on day 14 of illness tested negative which were repeated on day 15 of illness and report again came back negative for COVID-19 (Table 1). Since the patient was clinically stable, the patient was discharged and she remained asymptomatic on her online follow up 1 week later.

Conclusion

Our experience with this case of COVID-19 in Pakistan offers insight into atypical (the patient remained afebrile and developed dyspnea on the 3rd day of illness) and changing clinical findings of this novel disease entity. Early use of empirical antibiotics such as Levofloxacin could prevent disease progression by reducing inflammation of lung parenchyma without any overt side effects in our patient (Irene Karampelaa, 2020). Furthermore, standardization of isolation facilities and uniform training of the staff working there (according to WHO guidelines (WHO, 2020) might help in reducing transmission risk and infection rate in health care professionals.

References


care-when-novel-coronavirus-(ncov)-infection-is-suspected-2020012


**Figure 1.** WBC cell count with number of days in hospital
Figure 2: Lymphocytes % with respect to temperature (°F)

Table 1. Infection surveillance tests during hospitalization

<table>
<thead>
<tr>
<th>TEST</th>
<th>DAY 3</th>
<th>DAY 14</th>
<th>DAY 15</th>
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<tbody>
<tr>
<td>NP Swab</td>
<td>Pos</td>
<td>Neg</td>
<td>Neg</td>
</tr>
<tr>
<td>OP Swab</td>
<td>Pos</td>
<td>Neg</td>
<td>Neg</td>
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1. Neg negative, NP nasopharyngeal, OP oropharyngeal, Pos positive
2. Day 1 is initial day of hospitalization
Figure 3. Chest X-ray (PA view) demonstrated minimal infiltrates in right lower lung zones.