



CASE REPORT

## The Index Case of Covid-19 in Delta State, Nigeria: A Case Report

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### Keywords

COVID-19;

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### ABSTRACT

**Background:** Coronavirus disease (COVID-19) is a fatal respiratory infection that has spread rapidly around the world since it was first discovered in China in late 2019. Several management options and experiences have been observed across health systems globally including Nigeria. We report the progression and evolving clinical scenario of the first case of COVID-19 in Delta State, Nigeria.

**Methods:** We reviewed the hospital admission case record of the first case of COVID-19 in a 50-year-old male managed at the isolation centre of the Delta State University Teaching Hospital, Oghara, Delta State. All relevant information about the patient's clinical characteristics, investigations, treatment and outcome were obtained and documented.

**Results:** The patient was positive for COVID-19 and was placed on a wide-range of medications and supportive therapy. No baseline laboratory investigations were done throughout the period due to lack of a designated infectious disease laboratory to provide services at the time. Patient's overall wellbeing was based on physical assessment and monitoring of vital signs: temperature, pulse rate, respiratory rate, blood pressure and oxygen saturation (SPO<sub>2</sub>). Although he became symptom-free by the 12<sup>th</sup> day of admission, the laboratory report was persistently positive for Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-COV-2) until the 35<sup>th</sup> day of admission when he became negative.

**Conclusion:** This report showed that the patient had complete resolution of clinical symptoms without concomitant viral clearance. Also, intensive supportive care contributed to a favourable outcome in this patient. The need for improved surveillance and response systems to ensure better patient outcome is recommended.

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## INTRODUCTION

Coronavirus disease (COVID-19) is an emerging infectious disease characterized by mild to severe respiratory

symptoms and was responsible for the 2020 pandemic.<sup>1</sup> It is caused by an unusual strain of coronavirus, named Severe Acute Respiratory Syndrome

Coronavirus 2 (SARS-COV-2) because of its genotypical resemblance to 'SARS-CoV', the beta coronavirus that caused the Severe Acute Respiratory Syndrome (SARS) in 2003 but less typical to the 'MERS-CoV', the beta coronavirus that caused the Middle East Respiratory Syndrome (MERS) in 2012.<sup>2</sup> These viruses are known to undergo genetic recombination leading to new genotypes and outbreaks which results in pandemics.<sup>3</sup>

The 2020 pandemic started in mid-December 2019, in Wuhan City, Hubei Province, China, and rapidly spread to other parts of China by early January 2020.<sup>4</sup> The disease spread rapidly over China and by mid-January the disease was reported in other Asian countries. By the end of January, it had spread to 23 countries and by the end of February, it was reported in all continents of the world. The World Health Organization (WHO) declared the outbreak a Public Health Emergency of International Concern (PHEIC) on January 30<sup>th</sup> and subsequently a pandemic on March 11<sup>th</sup> 2020.<sup>1,4,5</sup> As at June 2021, over 214 countries had been affected with over four million laboratory-confirmed cases and 287,399 deaths.<sup>6</sup> Nigeria is one of the 214 countries affected

globally. The first case was confirmed in Lagos State on 27 February 2020. This index case was a 44-year old man, an Italian citizen who returned from Milan, Italy, on 24 February and presented at a health facility on 26 February 2020.<sup>7</sup> During the first 30 days of COVID-19 in Nigeria, the disease distribution was elitist. The majority of those who tested positive were returnees from abroad.<sup>8</sup> In Delta State, the first case was confirmed on the 7<sup>th</sup> of April 2020 in a 50 year old male returnee from Canada. By the end of June 2021, Delta State had 2,650 confirmed cases and 72 deaths.<sup>8</sup>

COVID-19 is primarily spread from person to person via droplet particles or by contact with contaminated surfaces.<sup>2,9</sup> When an infected person laughs, talks, spits, sneezes, or coughs, oropharyngeal or nasopharyngeal secretions are emitted into the immediate environment and can travel within 100cm to a potential host. It can also be transmitted indirectly via fomites and contaminated fingers from the droplets of an infected person to a susceptible host touching his eyes, nose, or mouth.<sup>2,9</sup> There is no clear proof of the incubation period but it is about 5.2 days following exposure to the

infectious agents.<sup>2</sup> The risk for the severe disease increases with age with older adults mostly affected and males more than females. The case fatality rate is about 2%.<sup>2,10</sup>

The disease is mostly characterised by fever, dry cough and fatigue but most symptomatic cases are mild and self-limiting. Other less common symptoms include myalgia, headache, sore throat, vomiting, and diarrhoea.<sup>9</sup> In some persons, such as the elderly and those with co-morbidities, it is severe. They could develop difficulty in breathing, chest pain, respiratory failure, septic shock, multi-organ dysfunction/failure and eventually die.<sup>9</sup> Evidence shows that about 13% of persons affected by COVID-19 had severe pulmonary dysfunction characterised by respiratory rate  $\geq 30$  cycles/minute, blood oxygen saturation (SPO<sub>2</sub>)  $\leq 93\%$ , the ratio of arterial oxygen partial pressure to fractional inspired oxygen (PaO<sub>2</sub>/FiO<sub>2</sub>)  $< 300$  and lung infiltrates  $> 50\%$  of the lung field within 24-48 hours.<sup>9</sup> There are also reports in some countries that the disease killed persons without any underlying co-morbidities. Healthy carriers are now being reported in large numbers,

discovered via active community testing.<sup>11-14</sup>

Earlier pathophysiology attributed the respiratory failure to Acute Respiratory Distress Syndrome (ARDS) due to pneumonia, but autopsy reports from Italian pathologies indicate widespread pulmonary venous microthrombosis as the likely cause of the hypoxaemic storm.<sup>10,15,16</sup> Excess cytokine production (cytokine storm) an immunologic response to the virus invading the cytoplasm results in widespread inflammatory exudates in the lungs, lung destruction and induces thrombosis.<sup>16,17</sup> There is also thromboembolism of blood supply to the brain, heart, and other organs.<sup>15,16</sup>

Numerous diagnostic tests, drug and vaccine trials were ceaselessly ongoing around the world for effective COVID-19 management and control. The definitive diagnosis is usually made by real-time Reverse Transcription-Polymerase Chain Reaction (real-time RT-PCR).<sup>18</sup> Drug therapies prescribed during the peak of the pandemic include antimalarials, antihelmintics, antibiotics, antivirals, anti-inflammatories and anticoagulants.<sup>19,20</sup> Preventive measures include isolation and treatment of confirmed cases, quarantine of close

contacts, contact tracing, social distancing (avoiding large crowds, social gathering and avoiding handshaking), wearing a face mask, observing cough etiquettes and hand washing/ hygiene.<sup>18</sup> The aim of this case report therefore was to describe the course and progression of the index case of COVID-19 in Delta State, the challenges experienced in managing the case and the evolving clinical scenario during admission.

### **CASE REPORT**

A 50-year-old male, with symptoms of fever and cough presented at a private hospital in Warri on the 23<sup>rd</sup> of March 2020, and was managed for malaria and upper respiratory tract infection for three days at the hospital. He was given 150 mg of artemether injection for three days and oral ciprofloxacin 500mg twice daily for 5 days. He returned to the private hospital when symptoms failed to abate three days after the initial treatment. This then necessitated a nasopharyngeal swab to be collected for COVID-19 test which turned out positive before he was consequently transferred to the Isolation Centre of the Delta State University Teaching Hospital, Oghara on the 8<sup>th</sup> of April 2020. Further history revealed that he had just

returned from Canada six weeks before developing the symptoms, albeit there was no history of contact with a confirmed case of COVID-19 or a family member with symptoms suggestive of COVID-19.

On admission, he was acutely ill-looking, febrile (temperature 39.4°C), not pale, not dyspnoeic (respiratory rate was 20cycles/minutes), oxygen saturation (SPO<sub>2</sub>) was 95% at room air, pulse rate was 97 beats per minute and blood pressure was 122/69mmHg. Random blood sugar (RBS) done was 128mg/dl. He was given hydroxychloroquine tablets 400mg twice daily for the first day, then 200mg daily for 5 days; Augmentin tablets 625mg twice daily for 7 days; Azithromycin tablets 500mg daily for 5 days; Zinc Supplement 220mg daily; Vitamin C tablets 1000mg daily for 10days; vitamin B complex and Paracetamol tablets. He was also advised on regular and liberal fluid intake.

The temperature was elevated for the first five days ranging from 37.9°C-39.9°C. He became tachypneic from the fourth day of admission with a respiratory rate of 40-48 cycles/minute, slight flaring of the alar nasi and SPO<sub>2</sub> of between 91% and

95% at room air. He was afterwards nursed in cardiac position, with oxygen delivered at 5 litres/minutes via face mask which improved oxygen saturation to 98% and followed by intermittent oxygen supplementation at 2-3 litres/minutes. Prednisolone tablets 80 mg stat was added on day 5, then 40mg twice daily over the next 5 days which was subsequently tapered down. Vitamin C dosage was also increased to 2000mg. On day 6, the body temperature reduced to 36.6 °C. It is of note that adjuvant therapeutic measures were introduced on day 4 which included daily sunbaths between 8-10 am, steam inhalation done twice daily, drinking warm water with lemon juice and psychotherapy support.

On day 8, the respiratory rate dropped below 24 cycles/minute and other symptoms were beginning to resolve. However, complete resolution of symptoms occurred by day 12. Two nasopharyngeal swab samples for the first re-test for COVID-19 was taken on day 9 which was negative, however, the second result turned out to be positive. An antiviral drug, Alluvia (Lopinavir-Ritonavir) 2 tablets twice daily for 10 days was introduced thereafter and completed on day 22.

Again, two nasopharyngeal swab samples for a second re-test for COVID-19 was collected on day 21 with one of the samples returning positive and the other negative. Tablet Chloroquine phosphate 500mg daily for 5 days was then commenced. A third repeat test was done by day 27, and the results returned positive. After this third result was positive, the patient was managed conservatively with anticipation of sero-conversion. Another sample was then taken on the 35<sup>th</sup> day of admission and the results returned negative. He was subsequently discharged home on the 14<sup>th</sup> of May 2020 to commence 75mg of aspirin daily and was followed up weekly for four weeks and monthly for 3 months at the out-patient clinic.

## **DISCUSSION**

The history of the index case in Delta State could not be traced to Canada from where he was said to have travelled down six weeks before presentation. This is because the incubation period of COVID-19 ranges between 2-14 days.<sup>2</sup> This finding was inconsistent with what was obtained in Nigeria's index case which was traced to Italy where the victim had arrived from.<sup>21</sup> Similarly, Ghana's first two cases of COVID-19 were imported

from Norway and Turkey, while that of Zambia came into the country from France.<sup>22,23</sup> This finding suggested that there was ongoing community transmission within Delta State. The dynamics of this disease transmission brought about the need for early diagnosis, contact tracing of suspected cases, prompt isolation and management of the early cases to prevent community transmission of COVID-19. This stresses the need for strengthening disease surveillance systems across international boundaries.<sup>24,25</sup> The history of this index case further revealed that he lived in Warri, a highly populated metropolitan city with features akin to that of Lagos State where the first case in Nigeria was reported. Having a strong index of suspicion is imperative during epidemics especially in densely populated areas where diseases may spread very rapidly.<sup>26-28</sup> An ecological study conducted in Italy showed that the rate of spread of COVID-19 was positively correlated with the population density and the public transportation per capita.<sup>27</sup> In another study, it was found that the attack rate of COVID-19 was relatively higher in crowded settings than less populated ones.<sup>28</sup>

Given that the index case had visited a private health facility on account of persistent malaria symptoms before he was made to undergo a COVID-19 test which turned out positive, brings to the fore the need for all healthcare workers irrespective of the location to be conversant with the concept of emerging and re-emerging infectious diseases.<sup>24,25</sup> This is because new diseases may erupt anywhere and would require that the receiving health professional should be alert and equipped to appropriately manage and contain the infection. It would be recalled that a similar scenario occurred during the Ebola disease outbreak where the index case in Nigeria visited a private hospital in Lagos, and the attending physician was able to identify and contain it, though, she became infected and later died from complications of the disease, for which she received many posthumous awards.<sup>29,30</sup>

Initially, private health facilities in Nigeria were prohibited from handling suspected cases of COVID-19, making it the sole responsibility of only some recognised government facilities to do so due to the virulent nature of the disease. Nonetheless, as the pandemic lingered on, with worsening morbidity

and mortality outcomes, more health facilities, including some accredited private health facilities were trained and allowed to manage the disease.<sup>31,32</sup> During the clinical management of this patient, it was observed that he became tachypneic on the 4<sup>th</sup> day of admission. This was worrisome owing to the fact that the increased respiratory rate could plunge the patient into severe respiratory distress which has been documented to be a common cause of mortality in COVID-19 patients,<sup>17,33</sup> though, this was quickly addressed by administering steroids which were gradually tapered off over some days.

It was found that the patient had the second negative test result for COVID-19 by the fifth week of admission which was quite long. This prolonged interval between obtaining the first and second negative test results before discharge and the high infectivity rate of COVID-19, could have resulted in the health facilities being overwhelmed with patients on admission. This was also observed in other isolation centres which may have informed the review of the discharge policy by the Nigeria Centre for Disease Control (NCDC) from two negative RT-PCR tests to one negative

test.<sup>34-36</sup> Furthermore, due to the increasing patient load in addition to the fact that most cases of COVID-19 were mild, advocacy for home management of COVID-19 was made and subsequently adopted in some centres, including Delta State.<sup>37</sup>

It should be recalled that the two naso-pharyngeal swab samples for the first repeat COVID-19 test done on day 9 was negative while the second was positive. Thereafter, two subsequent ones done after that still turned out positive which raised concerns (as the patient was anxiously waiting for discharge). The next negative test was eventually obtained on day 35. A possible reason for the persistent positive COVID-19 results after an earlier negative result could be attributed to the introduction of the systemic steroid on day 5. Reports indicate that systemic corticosteroids therapy may accentuate viral multiplication and thus prolong viral load in circulation and ultimately patient hospital stay.<sup>19,38,39</sup> In spite of the fact that COVID-19 was a novel disease without any treatment or vaccine, the outcome of the index case in Delta State was successful as the patient recuperated and was discharged home. The successful

outcome can partly be attributed to the intensive supportive care (supplemental oxygen, liberal fluid intake, adequate rest, daily sun bath, steam inhalation) the patient received. This brings to mind the key role of supportive care in the management of new diseases.<sup>29,40</sup> It should be recalled that supportive care was said to be responsible for containing the outbreak of the 2014-2015 Ebola outbreak in West Africa.<sup>29,30</sup>

**Conclusion:** This report showed that the patient had complete resolution of clinical symptoms without concomitant viral clearance. It also highlighted the need for intensive supportive care when treating COVID-19 infections as it contributed to the favourable outcome in this patient. Emerging and re-emerging diseases are gradually becoming topical public health issues that call for improved healthcare systems vis-à-vis improved surveillance and response systems particularly in developing countries. Therefore, there is need for improved training and re-training of the health workforce to have a high index of suspicion when faced with such situations. This is with a view to improving patient health outcomes.

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