

# CASE REPORT ON Management of COVID-19 Patient

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## ABSTRACT

*In late 2019, coronavirus disease-2019 (COVID-19), was reported in Wuhan, Hubei province, China<sup>1</sup>. It was declared a pandemic on March 11, 2020, having fulfilled the epidemiological criteria of more than 100,000 infections in at least 100 countries<sup>2</sup>. Coronavirus disease (COVID-19) is an infectious disease caused by the SARS-CoV-2 virus. The majority of the people who become ill with COVID-19 will experience mild to moderate symptoms and recover without special treatment. However, some will become severely ill and require critical care. We report the case of a middle-aged man, a known diabetic patient who was managed for moderate symptoms of SARS-CoV2 virus. He was admitted into the isolation ward, investigated, and had supportive care. He subsequently recovered without any sequelae and was discharged home 1 week after admission. We report this case to highlight the routine management of COVID 19 in a patient with comorbidity.*

**Keywords:** Covid-19, Management, diabetic patient

## INTRODUCTION

Coronavirus disease 2019 (COVID-19) is an infectious disease caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The first reported case was identified in Wuhan, China, in December 2019<sup>1</sup>.

The Symptoms of COVID-19 vary, but common symptoms include cough, fever, malaise dyspnea, anosmia, and loss of taste<sup>7</sup>. Symptoms may begin one to fourteen days after exposure to the virus. A third of people who are infected with covid 19 do not develop noticeable symptoms<sup>1</sup>. Of those people who develop symptoms, the majority of them will develop mild to moderate symptoms, while about 14% will develop severe symptoms, and 5% suffer critical symptoms needing intensive unit care<sup>2</sup>. Studies have shown that older people are at a higher risk of developing severe symptoms. People with diabetes are also more likely to have serious complications from COVID-19. However, the risk of severe symptoms from COVID-19 is likely to be lower if the diabetes is well controlled<sup>19</sup>. We highlight this case to evaluate the symptoms of covid 19 in a middle-aged diabetic man who recovered fully from covid 19 following management for moderate symptoms.

## CASE PRESENTATION

### Patient information:

A 59-year-old man presented at the casualty with cough of 2

weeks duration and malaise that started a week before presentation. Cough is mostly dry with occasional expectoration of scanty sputum. No pleuritic chest pain, no orthopnea or paroxysmal nocturnal dyspnea. No history of anosmia, loss of taste or sore throat. He subsequently developed malaise with generalized body weakness about a week before presentation, symptoms became profound in the 48hrs before presentation. There was associated poor appetite and an episode of postprandial vomiting. He noticed fever few hours before presentation which was high grade with associated chills. No disorientation, restlessness, neck pain or seizures. No bowel or urinary symptoms. He could not recall a history of contact with persons with confirmed or suspected covid 19.

For symptoms, he presented at a covid 19 testing center where he had a covid 19 rapid diagnostic test done 5 days prior presentation. Result returned positive. He had been self-isolating until symptoms worsened, this necessitated presentation in our hospital. He had completed a 5-day course of oral ivermectin and 3-day course of oral azithromycin while self-isolating.

He is a known diabetic on insulin with good glycemic control. He is not a known hypertensive. He received a dose of covid 19 vaccine about 2 months before presentation.

### Clinical findings:

At presentation in the acute surgical care, he was lethargic,

febrile with a temperature of 40° Celsius, he was not pale, but dehydrated. He was tachycardic at presentation, however, other vital signs were within normal range. His oxygen saturation in room air was 98%.

Examination of the chest and other regions were essentially normal.

#### **Diagnostic assessment:**

Investigations requested include a covid 19 PCR test which returned positive, full blood count showed neutrophilic leukocytosis, urea and creatinine were marginally elevated, procalcitonin was elevated with a value of 2ng/ml, C-reactive protein was 18mg/L, blood culture yielded no growth, liver function tests were essentially normal and chest x-ray was unremarkable. A random blood sugar done at admission was 9mmol/l (he had not used his insulin in the last 72hours before presentation because of poor oral intake)

#### **Diagnosis:**

A diagnosis of acute febrile illness secondary to SARS-CoV-2 infection in a known type 2 diabetic mellitus patient was made. A second diagnosis of severe sepsis with chest focus was also entertained.

#### **Therapeutic Intervention:**

He was subsequently admitted into the isolation ward and commenced on antipyretics, intravenous antibiotics, and fluid. Insulin was withheld temporarily until oral intake was deemed satisfactory. A deep venous thrombosis prophylaxis was also instituted. Oxygen saturation was to be monitored every 2 hours and random blood sugar every 4 hours.

Metformin was commenced third day on admission. Fever subsided subsequently except for occasional spikes. At a point he was commenced on glucose-potassium-insulin infusion as oral intake was noticed to be grossly insufficient. Patient never developed difficulty with breathing throughout admission and never needed supplemental oxygen as oxygen saturation was optimal all through. A repeat covid 19 PCR done on the 4<sup>th</sup> day of admission returned negative, however, he was still symptomatic. He was discharged 3 days after PCR results were seen and following resolution of symptoms.

He was followed up in the clinic, no long-term effects of covid 19 were observed or reported by patient.

## **DISCUSSION**

SARS-CoV-2 is the causative agent of coronavirus disease 2019 (COVID-19). Although the human species is often cyclically affected by pandemics, the COVID-19 pandemic declared on Mar 11th, 2020, is responsible for the world's largest pandemic since its century-old Spanish flu

counterpart<sup>20</sup>. Since identifying the foremost case in Wuhan, China, in December 2019, the exponential spread of the disease to all continents necessitated the need for rapid identification and optimized medical care to improve patients' diagnoses. As there is no specific antiviral treatment, optimized support is the most relevant contributor to patients' prognosis. For high-risk patients, it is indispensable to ensure access to intensive care as promptly as possible to prevent respiratory and cardiovascular complications.<sup>1</sup>

In Nigeria, the most recent data in 2020 states the incidence and fatality of the diseases were 5.6-7.8 per 100 000 population and 2.8-3.6%, respectively. The highest fraction of COVID-19 morbidity and mortality were recorded in persons aged 31–40 years (25.5%) and 61–70 years (26.6%), with males accounting for the more significant proportion of confirmed cases (65.8%) and deaths (79.0%)<sup>3</sup>.

The precise mechanism of SARS-CoV-2 transmission is not fully understood; however, human-to-human transmission occurs via two main routes<sup>4</sup>. The direct route is through close contact (<2meters) with infected persons, where respiratory secretions can easily enter the body through orifices. The indirect pathway is via touching objects or surfaces contaminated with respiratory secretions from infected persons and inoculating unaffected body orifices and mucous membranes<sup>2</sup>. The virion has four structural proteins known as the S (spike), E (envelope), M (membrane), which create the viral envelope and N (nucleocapsid) proteins which hold the RNA genome. The spike protein facilitates the virus' attachment to the angiotensin-converting enzyme 2 (ACE2) receptor present in ample supply in the epithelial cells of lungs, kidneys, intestines, and blood vessels, allowing fusion with the host cell membrane.

The virus' incubation period is an average of 14 days, with a median time of 5-8 days from exposure to symptoms onset<sup>1</sup>. Some patients remain asymptomatic, even though they may still transmit the virus, while others may experience signs and symptoms of the disease, which vary with its severity<sup>6</sup>. The symptoms may include difficulty breathing, fatigue, fever or chills, cough, body aches, headache, ageusia, anosmia, sore throat, rhinorrhea or congestion, nausea or vomiting and diarrhoea. Old age and comorbidities, including hypertension, cardiovascular disease and diabetes, bear the most significant risk of severe illness. Patients often present with respiratory difficulties and atypical presentations such as dermatologic manifestations like maculopapular rashes and fingernail discolourations.<sup>7,8,9</sup>

Investigating a patient with Covid-19 is primarily based on the guidance act established by the Centers for Disease

Control and World Health Organization but may be modified to suit a country's needs<sup>10</sup>. It involves using high-sensitivity and high-specificity tests such as the Nucleic Acid Amplification Tests (Reverse Transcription – Polymerase Chain Reaction). Antigen tests are available and are less expensive, making them suitable for at-home testing. Following a positive result, it is necessary to group patients into at-risk groups, such as those presenting with severe symptoms or those with comorbidities. Blood sugar monitoring, blood pressure monitoring, and other essential cardiovascular and respiratory conditions are indispensable in such cases<sup>10</sup>. Results of a meta-analysis found that the most prevalent laboratory findings in Covid-19 patients were increased C-reactive protein (CRP; 73.6%, 95% CI 65.0-81.3%), followed by decreased albumin (62.9%, 95% CI 28.3-91.2%), increased erythrocyte sedimentation rate (61.2%, 95% CI 41.3-81.0%), decreased eosinophils (58.4%, 95% CI 46.5-69.8%), increased interleukin-6 (53.1%, 95% CI 36.0-70.0%), lymphopenia (47.9%, 95% CI 41.6-54.9%), and increased lactate dehydrogenase (LDH; 46.2%, 95% CI 37.9-54.7%)<sup>17</sup>.

At-home treatment with adequate monitoring by an appointed health worker is recommended for mild to moderate cases to allow ICU facilities to sustain those in need. Isolation with sufficient rest and nutrition are essential on the road to the patient's recovery. It is imperative that the care giver stays healthy, protecting themselves by vaccination and hygienic practices<sup>11</sup>. For severe disease cases, patients are treated with a myriad of medications as no specific antiviral therapeutic agent is available against SARS-CoV-2. Upon admission, patients are treated with Remdesivir, the adenosine analogue that inhibits viral replication<sup>12</sup>. In Nigeria, other antiviral such as the lopinavir-ritonavir combinations, which inhibit the 3C-like proteinase essential to viral replication, are suitable alternatives due to their cheaper costs and availability<sup>13</sup>.

**Chloroquine and Hydroxychloroquine** are believed to reduce acidity in endosomal compartments of diseased cells. They also inactivate the virus and impair the terminal glycosylation of the ACE2 receptor, thus inhibiting the viral penetration into the cells. Despite its proven benefits, the effective dose required is staggeringly high, which can cause severe toxicity<sup>14</sup>. Medications that reduce inflammation (such as tocilizumab) bind to CD6 receptors, thereby blocking the activation of T lymphocytes and suppressing pro-inflammatory cytokines are also popularly used.

Mild to moderate disease has a relatively good prognosis. In contrast, severe conditions often are compounded with complications such as pneumonia, acute respiratory distress syndrome, cardiac injury, arrhythmia, septic shock, liver dysfunction, acute kidney injury, and multi-organ failure.

The more long-term complications of the disease are still under research, with reported symptoms such as joint pain, brain fog and depression being common<sup>15</sup>.

Diabetics are more likely to be immunocompromised, have reduced viral clearing ability and experience the effects of metabolic derangement. While this does not appear to render them more susceptible to Covid-19, it does increase the likelihood of severe disease in them. As Diabetes is one of the most common significant comorbidities encountered in Covid-19 patients, it is important to be aware of the management peculiarities in this class of patients. ACE 2 receptors have been implicated in SARS-COV 2 viral binding. Some of the drugs used routinely by diabetic patients such as glucagon-like peptide inhibitors may increase the number of ACE 2 receptors<sup>19</sup>. Hyperglycemia in diabetics may by excessive glycosylation of immunoglobulins among other mechanisms cause a reduced immune response to the Covid-19 virus<sup>18,19</sup>. A possible consequence of this is that diabetics are more likely to require mechanical ventilation as well as ICU admission with higher mortality rates. Patients with diabetes especially when poorly controlled, also suffer low-grade chronic inflammation that in turn may trigger cytokine storms<sup>19</sup>. Cytokine storms have been implicated in severe covid-19 disease sequelae as well as mortality<sup>18,19</sup>. Concluding, effective management of Covid-19 in diabetics involves following the general treatment guidelines while being aware of their peculiar risk factors for severe disease, keeping those factors under control, use of drugs that do not increase the ACE2 receptor levels, lowering blood glucose levels, and adhering to a healthy lifestyle<sup>19</sup>.

## CONCLUSION

Covid 19 is a contagious disease whose severity may vary. It is generally believed that those that are immunocompromised are at higher risk of getting severely sick from SARS-CoV-2. Early identification of those at higher risk of severe symptoms and prompt management goes a long way in reducing morbidity and mortality.

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