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Does Hypertonic Nebulization Improve Oxygen Saturation in Symptomatic Patients with COVID-19? A Case Report

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ABSTRACT

Background: COVID-19, is an infectious disease caused by a newly discovered coronavirus, SARS-CoV-2. In addition to common clinical presentations, formation of mucus plug has been demonstrated to occur in COVID 19. Several treatment modalities have been identified by scientists to manage the disease. Hypertonic saline has been shown to have anti-inflammatory effects on lung epithelium and beneficial effects have been reported in patients with lung diseases such as cystic fibrosis. There appears to be no published reports on the clinical effects of hypertonic saline nebulization in patients with COVID -19, especially in Africa. We sought to know if hypertonic saline nebulization improves oxygen saturation in patients with COVID-19 infection in Jos, North-Central Nigeria.

Methods: Five (5) mls of 4% hypertonic saline was used for nebulization. Each session lasted 20 minutes and it was performed once daily during the patient's entire hospital stay. Patients' oxygen saturation was measured before and after completing the procedure.

Result: *Case 1:* A 60-year old woman with type 2 diabetes mellitus and hypertension, presented with a 4-day history of fever, cough and difficulty breathing. She was dyspneic with SPO₂ of 62%. She had bilateral basal crepitations and her cardiovascular examination was essentially normal. COVID-19 was confirmed by RT-PCR. Her drug regimen included amoxicillin /clavulanic acid, azithromycin, chloroquine, vitamin E, vitamin C, vitamin D, zinc sulphate, frusemide, subcutaneous heparin, dexamethasone and 100% oxygen at 5L/min. Over the course of management, her SPO₂ improved from 62% to between 88% and 91%. Following nebulization with hypertonic saline, her SPO₂ further improved from 91% to 99%. Nebulization with hypertonic saline was subsequently included in her management and she continued to maintain an optimal SPO₂ with no signs of deterioration. *Case 2:* A 42-year old man with hypertensive heart disease presented with a 4-day history of fever, headache and cough. He had difficulty breathing for 2 days. His SPO₂ at presentation was 84%, no abnormal breath sounds were detected and cardiovascular signs were unremarkable. COVID -19 RT-PCR was positive. His drug regimen included amoxicillin -clavulanic acid, azithromycin, dexamethasone, chloroquine, vitamin C, vitamin E, vitamin D, zinc sulphate, subcutaneous heparin and 100% oxygen at 5L/min. His initial clinical response wavered with fluctuating oxygen saturation, between 81% and 96%. With hypertonic saline nebulization, his SPO₂ improved consistently up to 94%.

Conclusion: Nebulization with hypertonic saline appears to give some added benefit in patients with mild to moderate COVID-19. Further studies are needed to establish its role in routine COVID-19 care.

Key words: COVID-19, SARS-CoV-2, hypertonic saline, oxygen saturation, polymerase chain reaction