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Case Report

New Onset Encephalopathy Associated with Ivermectin Use

Samridh Gupta[1], Jin Tao[2], Vibhav Bansal[3]*, Sarah Linder[1], Vijayta Geeta Bansal-Kapuria[1], Drew Rust[1], Paul Jacob Pecorin[1] and Katherine Firch[1]

[1]University of Chicago College of Medicine, Rockford, IL, USA

[2]Internal Medicine, MercyHealth, Rockford, IL, USA

[3]Deparment of Neurology, Mercy Health Rockford, IL- USA

***Corresponding Author:** Vibhav Bansal, Deparment of Neurology, Mercy Health Rockford, IL- USA.

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Abstract

Ivermectin, an anthelmintic medication used to treat parasitic infections, has gained recent attention for

possible treatment of COVID-19. COVID-19 is an infectious disease caused by the SARS-Co-V-2 virus.

Ivermectin has been associated with severe adverse side effects including encephalopathy. Here, we report a case of a 76-year-old male with no significant past medical history presented with new onset encephalopathy following three days of self-medicated ivermectin use in treating COVIC -19 pneumonia. As a result of his altered mentation, he fell down 12-step staircase and experienced traumatic head injury with loss of consciousness. On admission, his head CT without contrast showed traumatic intracerebral hemorrhage bilaterally in the frontal and temporal lobes, subarachnoid hemorrhage, and nondisplaced left occipital and mastoid temporal fracture. No intervention was recommended at that time by neurosurgery. Patient's Covid-19 pneumonia was treated with 5-day course of remdesivir and 10-day course of dexamethasone along with use of supplemental oxygen. His respiratory status improved overtime, but his neurological status continued to decline. Unfortunately, patient passed away after five weeks of hospital stay. Encephalopathy is a rare side effect of ivermectin. Our case highlights the dangers of self-medication in treating COVID -19 pneumonia. We would like to encourage health care providers to educate patients about the potential adverse effects of off-label ivermectin use.

Keywords: Ivermectin; Encephalopathy; Confusion; Behavior Changes; Covid-19; Intracerebral Hemorrhage; Subarachnoid Hemorrhage; Ataxia

Abbreviations

PCR: Polymerase Chain Reaction; CT: Computed Tomography Scan; CTA: Computed Tomography Angiography

Introduction

Ivermectin, an anthelmintic medication used to treat parasitic infections, has gained recent attention for possible treatment of COVID-19. COVID-19 is an infectious disease caused by the SARS-Co-V-2 virus. The first documented case was in Wuhan, China in December of 2019 and is responsible for the most recent international pandemic [11]. The disease symptomatology is highly variable, but includes cough, shortness of breath, fever, fatigue, loss of smell, and loss of taste. An early study demonstrated that ivermectin can be used to treat COVID-19 in-vitro, and it gained popularity as a potential treatment. However, the study had significant flaws and failed to recognize the risks of ivermectin use.

Here we present a case of a patient who developed encephalopathy after self-medicating with ivermectin.

Case Presentation

A 76-year-old male with no significant past medical history presented with new onset encephalopathy following three days of self-medicated ivermectin use in treating COVIC -19 pneumonia. As a result of his altered mentation, he fell down 12-step staircase and experienced traumatic head injury with loss of consciousness. Family reported that patient seemed confused after taking ivermectin. His baseline mentation was alert and oriented x 4. He owned his own business, managed complex stock portfolios, and enjoyed playing golf in his spare time. Patient had no home medications, and denied history of smoking, alcohol, or other substance abuse. On admission, patient was afebrile, hemodynamically stable with heart rate of 73 beats/minute, respirations 16 per minute, blood pressure of 145/78 mmHg, and SpO_2 of 98% on room air. On physical exam, patient appeared lethargic and oriented to only self. Rest of the neurological exam was grossly intact. There was evidence of occiput injury with coagulated blood in the back of the head with left parietal scalp laceration. Complete metabolic panel and complete blood count were unremarkable. Urine analysis was negative for urinary tract infection. Urine toxicity screen was negative as well. COVID-19 PCR was positive. CT head without contrast showed traumatic intracerebral hemorrhage bilaterally in the frontal and temporal lobes, subarachnoid hemorrhage, and nondisplaced left occipital and mastoid temporal fracture. CT spine revealed no fractures and mild degenerative disease. CTA chest with IV contrast showed multifocal scattered ground-glass opacities consistent with COVID-19 pneumonia without evidence of pulmonary embolism. Neurosurgery was consulted and did not recommend intervention at this time. The patient was started on supplemental oxygen via nasal cannula, remdesivir, dexamethasone, and levetiracetam for seizure prophylaxis.

In the coming days, the patient began exhibiting signs of impulsive and inappropriate behavior. As time progressed, he became minimally interactive, often muttering incomprehensible words. Due to his delirium and agitation, the patient was started on quetiapine and mirtazapine which only minimally improved symptoms. Over the course of the next few weeks, the patient's respiratory status improved after completing 10 days of dexamethasone and 5 days of remdesivir. Despite the resolution of his Covid 19 symptoms, his mental status did not improve. He refused to eat and became bed bound. His family elected to pursue palliative care to focus on patient comfort. Unfortunately, patient died 5 weeks after his admission due to neurological decline from injuries sustained during the fall.

Discussion

Ivermectin recently gained popular attention following reports of its possible benefits for the treatment of COVID-19. While Ivermectin was found to decrease replication of COVID-19 *in-vitro*, there was no clinical benefit in treatment or prevention in randomized controlled trials [1]. Ivermectin has been increasingly popular among individuals who are seeking alternative prevention or treatment instead of the COVID-19 vaccine. It is believed that roughly 67% of Americans are currently vaccinated [9]. This could indicate that a large percentage of the population may seek alternative treatments. According to the CDC, the number of prescriptions of ivermectin have increased to 88,000 per week compared to 3,600 prior to the pandemic [8]. However, ivermectin is not without its side effects. In fact, the FDA has warned against usage of the drug since April of 2020 [5].

The adverse effects of ivermectin have been most noticeably demonstrated in a Senegal case report on post-ivermectin encephalopathy. The report describes patients who suffered ataxia, altered consciousness, speech disturbances, and headaches after ingestion of ivermectin in the absence of onchocerciasis. These symptoms are thought to occur approximately 48 hours after ingestion [4]. Reports from studies documenting the treatment of onchocerciasis have shown 207 serious adverse events after ivermectin. Sixty-five of these cases were deemed to be post-ivermectin induced Loa Loa encephalopathy. Approximately 85% of these cases were noted to be male [12].

The exact mechanism of encephalopathy after ivermectin use remains unclear. One possible hypothesis is that individuals who develop neurological deficits after ivermectin may have a mutation in the multidrug resistance-1 (MDR-1) gene. Patients with MDR-1 mutations are theoretically thought to have higher drug concentrations crossing the blood brain barrier [2]. More research is needed to fully identify the causes of ivermectin-induced encephalopathy.

Conclusion

Here we present a case of new onset encephalopathy following three days of self-medicated ivermectin use in treating COVIC -19 pneumonia. Encephalopathy is a rare side effect of ivermectin. Our case highlights the dangers of self-medication in treating COVID -19 pneumonia. We would like to encourage health care providers to educate patients about the potential adverse effects of off-label ivermectin use.

Conflict of Interest

The authors have no financial interest or any conflict of interest to declare.

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