

CASE REPORT

Ivermectin Associated Neurotoxicity: A Case Report

JOHN TEIJIDO^{1,*} , JERRY SURIANO¹ 

¹Emergency Medicine Specialists, S.C. 10625 W North Ave #101b, Wauwatosa, WI 53226, United States of America

Abstract

Introduction: During the COVID-19 pandemic, drug repurposing attempts increased due to limited therapeutic options in the setting of a high morbidity illness. Drug repurposing may also be utilized by those looking for alternative treatment modalities when faced with new medical illnesses. This case report demonstrates the danger of ivermectin use outside of its typical indications.

Case Report: A 69-year-old female presented to a hospital in Milwaukee, Wisconsin, United States of America with altered mental status. She was difficult to awake from sleep by her family. She had a recent diagnosis of metastatic breast cancer. Her initial evaluation including cerebral imaging and infectious assessment did not reveal an etiology for her encephalopathy. She was admitted to the hospital, and during her continued neurologic evaluation she made a gradual recovery. It was revealed by the patient and her family that she had been taking daily ivermectin as an attempted cancer treatment.

Discussion: Ivermectin is used as a deworming agent in veterinary medicine. Ivermectin potentiates gamma-aminobutyric acid (GABA)-gated currents. This explains its clinical effects of central nervous system depression. Treatment of ivermectin toxicity involves symptomatic and supportive care with gastrointestinal decontamination with activated charcoal if the ingestion occurs within 1 to 2 hours.

Conclusion: The undifferentiated encephalopathic patient often requires a broad laboratory and imaging evaluation. As in this case, taking a thorough history of present illness revealed ivermectin associated neurotoxicity as her final diagnosis. Emergency clinicians must be vigilant of this possible diagnosis especially with increasing attempts at drug repurposing.

Keywords: Ivermectin, Overdose, Encephalopathy

How to cite this article: Teijido J, Suriano J. Ivermectin Associated Neurotoxicity: A Case Report. Asia Pac J Med Toxicol. 2026; 15(2):69-70.

INTRODUCTION

During the COVID-19 pandemic, drug repurposing attempts increased due to limited therapeutic options in the setting of a high morbidity illness. In vitro studies showed activity against the COVID-19 virus, but this did not translate to clinical practice [1-3]. Similarly, in-vitro animal studies for treatment of HIV, asthma, certain neurologic diseases, and cancer may have contributed to indication creep of ivermectin [4]. We report a case of neurotoxicity associated with the use of ivermectin for the self-treatment of breast cancer.

CASE PRESENTATION

A 69-year-old female was brought to the emergency department by her family due to somnolence and word finding difficulties. She was recently diagnosed with breast cancer and had been self-treating with ivermectin. Her vital signs at presentation were blood pressure of 159/86 mmHg

respiratory rate of 25 breaths per minute, temperature of 37.1 degrees Celsius, and oxygen saturation of 97% on room air. She would wake to verbal stimuli, follow one or two commands, and then promptly go back to sleep. Her laboratory tests were unrevealing. Among her hemogram, electrolyte panel, hepatic function panel, urinalysis, salicylate screen, and acetaminophen screen, no abnormal findings were identified. Her 12-lead electrocardiogram was normal, and computed tomography of the head with computed tomography with angiography of the head and neck did not show an intracranial hemorrhage or cerebrovascular abnormality. Magnetic resonance imaging of the brain and electroencephalogram showed no intracranial abnormality and no epileptiform discharges. Within 24 hours of her admission, the patient's mental status improved. She admitted to taking 4 mL at an unknown concentration of ivermectin daily for three weeks. She otherwise had no medication changes prior to her presentation. Negative advanced imaging and improvement

*Correspondence to: John Teijido, MD. Emergency Physician. Emergency Medicine Specialists, S.C. 10625 W North Ave #101b, Wauwatosa, WI 53226, United States of America. Email: john.teijido@gmail.com. Phone: 309-236-5833.

with cessation of ivermectin made cancer-related encephalopathies less likely. She was discharged with a diagnosis of neurotoxicity from ivermectin.

DISCUSSION

Ivermectin is used as a deworming agent in veterinary medicine. It was approved by the Food and Drug Administration for parasitic infections and for treating rosacea. Numerous concentrations of ivermectin are available including 10 mg/mL for human prescriptions, while veterinary products come in 1, 5, 10, and 20 mg/mL with impregnated skin patches, creams, and injectable formulations available. Ivermectin potentiates gamma-aminobutyric acid (GABA)-gated currents. This explains its clinical effects of central nervous system depression. Patients may also experience abdominal cramping and vomiting. It is believed that ivermectin has cellular targets that may have anti-cancer activity although not with accompanying evidence for this indication [1-5].

When considering the ingestion dosage, pharmacological studies in animals list 2 mg/kg to 10 mg/kg of ivermectin as safe, although numerous medication interactions have demonstrated an increased risk for ivermectin toxicity. This added layer of complexity and lack of a known toxic dose underscores the importance of clinical judgement when determining toxicity from ivermectin. Treatment of ivermectin toxicity involves symptomatic and supportive care with gastrointestinal decontamination with activated charcoal if the ingestion occurs within 1 to 2 hours [1, 4].

CONCLUSION

Undifferentiated encephalopathy as a presenting symptom requires a broad evaluation. Obtaining a thorough history was the key to making the diagnosis of ivermectin associated neurotoxicity in this case. Vigilance for this potential ingestion in the right clinical scenario is critical to

avoid serious neurologic sequelae.

Ethical Considerations

Written consent from the patient was obtained for publication of this case report.

ACKNOWLEDGMENTS

Not applicable.

Conflict of interest: The authors declare no conflict of interest.

Funding and Support: The authors received no financial support for this article’s research, authorship, and publication.

REFERENCES

1. Shirazi FM, Mirzaei R, Nakhaee S, Nejatian A, Ghafari S, Mehrpour O. Repurposing the drug, ivermectin, in COVID-19: toxicological points of view. Eur J Med Res. 2022 Feb 5;27(1):21. doi: 10.1186/s40001-022-00645-8. PMID: 35123559; PMCID: PMC8817475.
2. Hoang R, Temple C, Correia MS, Clemons J, Hendrickson RG. Characteristics of ivermectin toxicity in patients taking veterinary and human formulations for the prevention and treatment of COVID-19. Clin Toxicol (Phila). 2022 Dec;60(12):1350-55. doi: 10.1080/15563650.2022.2134788. Epub 2022 Nov 14. PMID: 36374218.
3. Bhardwaj P, Valladares D, Gutman CK, Lucas JK, Kelly MN. Acute Visual Disturbances and Ataxia Secondary to Attempted COVID-19 Prophylaxis With Ivermectin in a Nine-Year-Old. Cureus. 2023 Mar 9;15(3):e35944. doi: 10.7759/cureus.35944. PMID: 37038566; PMCID: PMC10082620.
4. Hall AH, Spoerke DG, Bronstein AC, Kulig KW, Rumack BH. Human ivermectin exposure. J Emerg Med. 1985;3(3):217-9. doi: 10.1016/0736-4679(85)90075-7. PMID: 2869080.
5. Nguyen J, Nguyen TQ, Han BO, Hoang BX. Oral Fenbendazole for Cancer Therapy in Humans and Animals. Anticancer Res. 2024 Sep;44(9):3725-35. doi: 10.21873/anticancer.17197. PMID: 39197912.