SHORT COMMUNICATION

Acute Psychosis Secondary to Isoniazid in a Patient with Pulmonary Tuberculosis

Shatavisa Mukherjee[1], Siddhartha Roy[2]

Received on: 06 April 2023; *Accepted on:* 10 June 2023; *Published on:* 04 August 2023

Abstract

Isoniazid (INH) is one of the first-line drugs used in the treatment of tuberculosis (TB). Though considered safe, mild to moderate adverse reactions secondary to INH has been noted in various patients. In some cases, though infrequent, INH may induce psychiatric reactions including delirium, hallucinations, paranoia, acute psychosis, etc., via acting as a monoamine oxidase (MAO) inhibitor or by decreasing pyridoxine. The present report details a case of acute psychosis secondary to INH use in a 47-year-old female patient with pulmonary tuberculosis.

Keywords: Acute psychosis, Drug induced psychosis, Isoniazid.

Bengal Physician Journal (2023): 10.5005/jp-journals-10070-8010

Introduction

Tuberculosis (TB) is regarded as one of the world's leading infectious disease killers.[1] Isonicotinic acid hydrazide or isoniazid (INH), introduced over half a century ago, is still one of the prime drugs used in the treatment of TB infection.[2] It is one of the first-line anti-TB drugs (ATD) along with rifampicin, pyrazinamide, ethambutol, and streptomycin, and has been considered both safe and effective. Though considered safe, mild to moderate adverse reactions secondary to INH has been noted in various patients. Adverse reactions majorly include peripheral neuropathy, hepatitis, and cutaneous manifestations like generalized rash, dress, Stevens-Johnson Syndrome, etc. However, neurologic reactions including convulsions and ataxia, and psychiatric reactions including delirium, hallucinations, paranoia, and acute psychosis have been also reported.[3] The present case details a report of acute psychosis secondary to INH in a female with pulmonary TB.

Case Description

A 47-year-old female, with no history of psychiatric illness, presented to the emergency facility, with sudden onset of psychotic symptoms, which included incoherent speech, paranoid delusion, psychomotor agitation, auditory hallucinations, and sleep-onset insomnia for the last 2 days. Reportedly, 5 days ago, the patient was diagnosed with a case of pulmonary TB with positive radiological findings suggestive of lymphadenopathy, where contrast-enhanced CT showed hilar and mediastinal lymph nodes with a central hypodense area. The patient was initiated on ATD with isoniazid 300 mg/day, rifampicin 600 mg/day, pyrazinamide 1500 mg/day, ethambutol 1200 mg/day, and pyridoxine 20 mg/day.

No prior medical history or history of substance abuse was noted. Negative family history of psychiatric illness was stated. A mental state examination conferred her as suspicious and poorly cooperative, with psychomotor agitation and paranoid delusions. A General physical examination revealed stable vitals and normal physical signs. Normal laboratory findings including hemogram, liver function, and thyroid function were reported. Urine toxicology findings were also unremarkable. Brain imaging did not show any abnormal findings.

A diagnosis of drug-induced acute psychosis was made, with isoniazid as the prime suspect owing to its greater propensity to cause the event. On admission, all antitubercular drugs were stopped and she was initiated on olanzapine 15 mg/day. Her psychotic symptoms subsided by day 6. The antitubercular therapy was again initiated in graded order with rifampicin at day 9, pyrazinamide at day 11, and ethambutol at day 15. On day 10, her antipsychotic dosage was tapered down, and she was discharged after another 10 days with olanzapine 5 mg/day and antitubercular therapy. The patient stopped taking olanzapine after a week after her discharge. The patient remained stable, with no relapse of psychotic manifestations in the subsequent visits to the facility.

Pharmacovigilance workup including the causality and severity assessment was done. Causality assessment using World Health Organization-Uppsala Monitoring Centre (WHO-UMC) causality assessment scale revealed the case to be under a 'probable' grade, while the severity of the case was of 'moderate' grade as established using Hartwig Seigel scale.[4,5] The case was reported to the National Pharmacovigilance Platform.

[1]Department of Clinical and Experimental Pharmacology, Calcutta School of Tropical Medicine, Kolkata, West Bengal, India

[2]Independent Researcher, Kolkata, West Bengal, India

Corresponding Author: Shatavisa Mukherjee, Department of Clinical and Experimental Pharmacology, Calcutta School of Tropical Medicine, Kolkata, West Bengal, India, Phone: +91 9830529192, e-mail: shatavisa100@gmail.com

How to cite this article: Mukherjee S, Roy S. Acute Psychosis Secondary to Isoniazid in a Patient with Pulmonary Tuberculosis. Bengal Physician Journal 2023;10(2):73–74.

Source of support: Nil

Conflict of interest: None

Patient consent statement: The author(s) have obtained written informed consent from the patient for publication of the case report details and related images.

Discussion

Isoniazid induced psychosis was first described in the year 1957 by Jackson SL in his series of five cases, in two of which paranoid delusions were prominent. The cases presented with classical symptoms such as mental depression, argumentative behavior, grandiose ideas, euphoria, and complex delusions. None of such patients had any previous history of mental illness.[6] Since then, there have been various reports commenting on psychotic manifestations due to INH.[7]

Numerous studies have documented INH-induced psychosis in patients with or without a psychiatric history who have been in either INH monotherapy or in combination with other ATDs.[8–11] However, the onset of psychotic symptoms after treatment initiation varies considerably from days to months. Clinical manifestations encompass a wide spectrum including paranoid delusions, hallucinations (auditory, visual, and tactile), psychomotor agitations, and suicidal ideations.[8–11]

The mechanism behind INH-induced psychosis is not clearly understood. However, INH is known to affect normal neuronal functioning. Two possible hypotheses were suggested by Pallone et al. in this regard.[12] The first hypothesis suggests that mono amine oxidase (MAO), responsible for the degradation of neurotransmitters such as serotonin and amines, is inhibited by isoniazid, which can result in an increase in the concentration of serotonin and catecholamines in the brain; thereby precipitating psychotic episodes. The second hypothesis involves vitamin B6 deficiency owing to isoniazid. Pyridoxal, the most predominant form of vitamin B6 in the body, in combination with isoniazid, can disturb the normal tryptophan metabolism, suggesting its implication in inducing psychosis.[12]

Acute psychosis secondary to INH is usually managed by cessation of INH or treatment with antipsychotics or a combination of both.[10,13,14] However the duration of antipsychotic treatment varies from days to months. The reaction usually subsides once the precipitating stressors are withdrawn or the dose is reduced.

Conclusion

Psychiatric adverse effects of drugs, though relatively infrequent, may have significant potential to thwart the treatment and trigger psychological distress. Timely diagnosis, prompt withdrawal of the suspected drug, and management of the psychotic events may help with safer patient outcomes.

Acknowledgment

The authors would like to acknowledge and support the untiring efforts and contribution of the Pharmacovigilance Programme of India toward ensuring better patient safety nationwide.

Orcid

Shatavisa Mukherjee https://orcid.org/0000-0001-9524-1525

References

1. Tuberculosis. Accessed from: https://www.usaid.gov/global-health/health-areas/tuberculosis/resources/publications/usaid-global-tuberculosis-strategy-2023-2030.
2. Murray JF, Schraufnagel DE, Hopewell PC. Treatment of tuberculosis. A historical perspective. Ann Am Thorac Soc 2015;12(12):1749–1759. DOI: 10.1513/AnnalsATS.201509-632PS.
3. Information from VigiAccess. Accessed from: www.vigiaccess.org.
4. The use of the WHO-UMC system for standardized case causality assessment. World Health Organization (WHO) - Uppsala Monitoring Centre. Available from: http://www.who-umc.org/Graphics/24734.pdf.
5. Hartwig SC, Siegel J, Schneider PJ. Preventability and severity assessment in reporting adverse drug reactions. Am J Hosp Pharm 1992;49(9):2229–2232. PMID: 1524068.
6. Jackson SL. Psychosis due to isoniazid. Br Med J 1957;2(5047):743–746. DOI: 10.1136/bmj.2.5047.743.
7. Lawn SD, Zumla AI. Tuberculosis. Lancet 2011;378(9785):57–72. DOI: 10.1016/S0140-6736(10)62173-3.
8. Baytunca MB, Erermis S, Bildik T, et al. Isoniazid-induced psychosis with obsessive-compulsive symptoms (Schizo-Obsessive Disorder) in a female child. J Child Adolesc Psychopharmacol 2015;25(10):819–820. DOI: 10.1089/cap.2014.0065.
9. Iannaccone R, Sue YJ, Avner JR. Suicidal psychosis secondary to isoniazid. Pediatr Emerg Care 2002;18(1):25–27. DOI: 10.1097/00006565-200202000-00008.
10. Witkowski AE, Manabat CG, Bourgeois JA. Isoniazid-associated psychosis. Gen Hosp Psychiatry 2007;29(1):85–86. DOI: 10.1016/j.genhosppsych.2006.10.010.
11. Bourgeois JA, Zelenko M, Waraich BS. Psychotic disorder associated with isoniazid. Mil Med 1996;161(11):707. PMID: 8961730.
12. Pallone KA, Goldman MP, Fuller MA, et al. Isoniazid-associated psychosis: Case report and review of the literature. Ann Pharmacother 1993;27(2):167–170. DOI: 10.1177/106002809302700205.
13. Alao AO, Yolles JC. Isoniazid-induced psychosis. Ann Pharmacother 1998;32(9):889–891. DOI: 10.1345/aph.17377.
14. Schrestha S, Alao A. Isoniazid-induced psychosis. Psychosomatics 2009;50(6):640–641. DOI: 10.1176/appi.psy.50.6.640-a.