

Methotrexate-induced psychosis in childhood cancer: a case report



Arjun Nanda, MD¹, Janet Charoensook, MD^{1,2}, Steven Storage, MD^{1,2}, Julienne Jacobson, MD^{1,2}

¹Keck School of Medicine, Department of Psychiatry, Los Angeles, CA, USA ²Children's Hospital of Los Angeles

Background

Methotrexate is a chemotherapy and immunosuppressive medication used to treat cancer and autoimmune conditions. There is currently limited data on methotrexate-induced psychosis, particularly in adolescents, and those without a prior diagnosis of bipolar disorder or a primary psychotic disorder.

Patient characteristics

14-year-old boy with T-cell ALL CNS 2. Course c/b an anterior mediastinal mass, tumor lysis syndrome, lung nodules, severe malnutrition, refeeding syndrome, and SIADH due to vincristine. Received intrathecal chemotherapy – 15 mg of methotrexate, 30 mg of cytarabine, 15 mg hydrocortisone, which he received and tolerated in the past.

Course and Management

- 5 days after chemotherapy = agitated, hyperverbal, did not recognize family, hallucinating
- Dextromethorphan started for ?methotrexate neurotoxicity. D/c due to non-response.
- Two brain MRIs were conducted a week apart; no methotrexate neurotoxicity
- MRV head unremarkable. CSF was negative for any paraneoplastic cause and the neurology service did not believe that he had encephalitis.
- Psych assessment = responding to internal stimuli, screaming nonsensically in both English and his native language.
- Olanzapine started, titrated up to 10mg total daily dose
- Developed echolalia/echopraxia, grew more agitated, became rigid and had automatisms
- Started on lorazepam for catatonia, titrated to 2.5mg, olanzapine was held
- Started having lucid periods = recognizing family members, eating, and inquiring about medical interventions
- Continued to be agitated → valproic acid 250 mg twice daily initiated to treat mania and agitation
- Quetiapine started 2 weeks later to address hallucinations, paranoia, and disorganized thought process - effective
- Lorazepam tapered once valproic acid level was therapeutic
- After discharge = mentation still slightly impaired, with mild confusion and racing thoughts
- Functioning well enough to be able to return to virtual school with extra accommodations

Timeline of presentation



Discussion

The temporal relationship between intrathecal methotrexate administration and psychotic symptoms provides further evidence that methotrexate can induce a psychotic episode in adolescents. This patient's case also was complicated by catatonia, further obfuscating his presentation and treatment. With few reports of methotrexate-induced psychosis available in the literature, more data about this rare presentation will be helpful to guide effective treatment for clinicians.

References

Methotrexate [package insert]. Hunstville, AL: DAVA pharmaceuticals; 2016.
 Hariram J, Jegan Y. Contribution of methotrexate in precipitation of manic episode in bipolar affective disorder explored: a case report. *Ther Adv Psychopharmacol*. 2013;3(4):251-254.