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Case Report

Steroid-Induced Acute Psychosis in an 8-Year-Old Child with Inflammatory Bowel Disease

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Abstract

We present a case of an 8-year-old male child diagnosed with Crohn's disease, and he experienced a steroid-induced psychosis during induction of remission with corticosteroid therapy. This study aims to report a steroid-induced psychosis in the pediatric age group and add this case to the limited number of reported pediatric patients who developed a steroid-induced psychosis with a focused review of the literature.

Keywords: Inflammatory bowel disease, psychosis, pulse therapy, steroids

Introduction

Corticosteroids are highly effective and frequently used medication for several acute and chronic medical illnesses in children and adolescent, including inflammatory bowel disease (IBD). However, corticosteroids are associated with diverse and sometimes severe adverse effects, both physiologic and psychiatric. The physiologic side effects of corticosteroid therapy include growth retardation, immune suppression, hypertension, osteoporosis, avascular necrosis of bones, gastritis, fluid and electrolyte disturbances, seizures, endocrine disturbances, and cataracts which have been extensively studied and reported in the literature. In contrast, the psychiatric adverse effects, which are one of the severe steroids side effects, have received less attention.[1,2] These effects have a broad spectrum of symptoms that range from subtle mood changes, insomnia, cognitive impairment to severe mental illness, including frank psychosis and severe depression.[3,4] These mental side effects of corticosteroids have been well documented and established in the adult population, while literature about steroid-induced psychotic disorder in children and adolescents is limited.

We present a case of an 8-year-old male child diagnosed with Crohn's disease (CD), and he experienced a steroid-induced psychosis during induction of remission with corticosteroid therapy. This study aims to report a steroid-induced psychosis in the pediatric age group and add this case to the

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limited number of reported pediatric patients who developed a steroid-induced psychosis with a review of the literature.

Case Report

An 8-year-old previously healthy male child was referred to a pediatric gastroenterology clinic with a history of bloody diarrhea and abdominal pain for 3 months. His medical history was noncontributory with no positive family history of autoimmune disease, and there was no known patient or family history of any psychiatric illness. On examination, he was unwell but vitally stable, including blood pressure. His weight was 22 kg, height was 121 cm (13th and 11th centile, respectively), and body mass index of 15 (31st centile). Systemic examination was unremarkable, apart from signs of wasting. His investigation showed an erythrocyte sedimentation rate of 26 mm/h, C-reactive protein of 75.8 mg/L, and fecal calprotectin level of 901 μg/g. Blood counts, blood sugar, electrolytes, and liver function tests were all normal. Ferritin level was low at 6.9 ng/ml.

Esophagogastroduodenoscopy was normal, while colonoscopy showed edematous mucosa, erythema, loss of vascular markings, mucosal friability, and cobblestone formation. Based on these findings, he was diagnosed with the CD. As per current ECCO/ESPGHAN guidelines for managing pediatric CD, the first choice of remission induction management is nutritional therapy. Unfortunately, this option was not locally available because of a shortage of supplies. Therefore, oral prednisolone was started at 1.5 mg/kg/day (total dose 30 mg/day) for 2 weeks, followed by gradual withdrawal. His symptoms initially settled, but when steroid tapering started, he became seriously sick, developed severe abdominal pain and profuse bloody diarrhea. He was admitted to the pediatric ward and started on pulse therapy with intravenous methylprednisolone at a dose of 10 mg/kg/day for 3 days. He was also started on intravenous fluids, ciprofloxacin, omeprazole, Vitamin D, and calcium gluconate. He started to improve clinically, but on the 4th day of admission, he experienced agitation, hallucination, delusion, and abnormal behavior. He was alert, fully oriented, and aware of persons and place. Steroid dose was gradually reduced and could not be withdrawn because of disease activity. The hallucination and the abnormal behavior persisted for 3 weeks following the gradual reduction of steroids.

Meanwhile, he was seen by a child psychiatrist who started him on 0.5 mg of risperidone twice a day, after which the patient showed significant improvement. While he was on steroid withdrawal at a dose of 10 mg/day (0.4 mg/kg/day), he developed relentless vomiting and abdominal pain without diarrhea, which necessitated restarting methylprednisolone smaller dose (2 mg/kg/day for 3 days). Unfortunately, his psychiatric symptoms recurred though in a milder form. Methylprednisolone was stopped again, and the patient was continued on a small dose of prednisolone. In addition to psychiatric management, follow-up showed complete recovery of psychiatric symptoms.

Discussion

This case presents the finding of a strong temporal relationship between the development of psychiatric symptoms and the use of pulse intravenous therapy with methylprednisolone. Corticosteroids can induce a spectrum of psychiatric symptoms ranging from subtle mood changes to frank psychosis. In the Diagnostic and Statistical Manual of Mental Disorder-5th edition, steroid-induced psychosis is categorized as medication-induced psychotic disorder (American Psychiatric Association).[5] The criteria for medication-induced psychosis include that the patient must experience episodes of delusion, hallucination, or impaired cognition during or soon after the use of medication capable of producing these symptoms; the psychotic symptoms cannot be explained by a psychotic disorder that is not medication induced. Furthermore, the symptoms must also cause clinically significant distress. Overall, the pathogenesis of these psychiatric sequelae of steroid treatment remains poorly understood, and it is a diagnosis of exclusion. Thus, it is crucial to exclude other problems that could cause psychiatric symptoms, such as other medication, intoxication, electrolyte disturbance, infection, hypoglycemia or hyperglycemia, and

known psychiatric cause.[6] In this case, the physical examination and investigations, including blood sugar, electrolytes, and complete blood count, rechecked when he developed psychosis, and they all were normal.

Corticosteroids have been used in various forms and doses for inducing remission in children with IBD. However, several studies and case reports implicate both oral and parenteral corticosteroids in inducing psychiatric adverse effects. Mrakotsky *et al*. found that IBD-treated pediatric patients with high-dose systemic steroids reported more problems with cognitive functioning and thought problems. Furthermore, they reported more depressive symptoms than the IBD control group on remission who had not received steroid for at least 6 months and in the same study reported three patients who had developed acute transient psychosis while on high-dose steroid.[7] Furthermore, Kim *et al*. reported a 16-year-old female patient diagnosed with CD, which showed psychotic changes after 2 weeks of administering prednisolone 60 mg/day, which recovered gradually after 1 week of discontinuation steroid and starting antipsychotic therapy.[8]

The consensus guidelines of ECCO/ESPGHAN on the medical management of pediatric CD states that "In children and adolescents who did not have finished their growth, exclusive enteral nutrition is the induction therapy of the first choice due to its excellent safety profile, preferable over corticosteroids, which are equipotential to induce remission."[9] On the same consensus guideline, when prednisolone fails, then budesonide is the 2nd line. In this case, neither the whole protein formula nor budesonide was available locally. It is common practice in economically constrained and imbalanced health systems that health-care professionals' resort to older therapy modalities due to lack of more recent ones.

Corticosteroids are also an essential component in treating children and adolescents with acute lymphoblastic leukemia (ALL). In 2005, Hochhauser *et al*. reported four children who developed behavioral and/or psychiatric changes while receiving dexamethasone in an ALL protocol of the Cancer Institute of New Jersey.[10]

Folusho and Adebowale reported a case series of seven children with nephrotic syndrome who developed abnormal behaviors as visual and auditory hallucinations, inappropriate behavior and speech with suicidal attempt, and social withdrawal. Diagnoses given were steroid-induced psychosis and delirium, while treatment given included antipsychotic treatment and reduction or discontinuation of prednisolone.[11]

Hodgins *et al*. reported a steroid-induced psychosis in a 12-year-old child with discoid-lupus erythematosus. After few days of treatment with 40 mg prednisone daily, this child started to behave abnormally, became speechless, and was not responding. Treatment could not be stopped due to acute exacerbation of lupus, necessitating the continuation of therapy. A neurologist was consulted to rule out lupus cerebritis, and psychosis was treated with haloperidol 5 mg, but psychosis did not resolve until the steroid taper was complete and prednisone stopped. In the same study, the authors reviewed 13 pediatric cases of steroid-induced psychosis that has been reported to date. The age ranged between 5 and 17 years, and there was more male than females affected.[12]

These acute effects on behavior and mood may be more prominent in younger (preschool) children than in older children and adolescents.[13]

The higher doses of steroids carry more chances of developing psychiatric adverse effects.[6] Our patient developed psychotic symptoms when a higher steroid dose was used. The time between the start of steroid therapy and the occurrence of psychotic symptoms varies from 1 day to as long as 4 months. Discontinuation of steroids showed symptoms improvement in some patients while others required antipsychotic medication.

Conclusion

Clinicians should be aware of the possibility of variable behavioral and psychological effects when prescribing corticosteroids for the pediatric age group for various medical problems. Parents should

be informed to look for these adverse effects. Mild psychotic illness and subtle mood changes may pass unnoticed. Further research was needed to study the exact prevalence of steroid-induced psychosis in the pediatric age group and to study the effective treatment strategy. Pulse methylprednisolone therapy showed a high potential of inducing psychiatric illness in this case. Comparing the incidence of the potential of different forms of steroids to induce psychosis is worth studying.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the legal guardian has given his consent for images and other clinical information to be reported in the journal. The guardian understands that name and initials will not be published and due efforts will be made to conceal patient identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

Compliance with ethical principles

Prior ethical approval is not required for single case reports, and small case series and data are presented anonymously.

References

1. French J, Khan A, White H. Steroid-induced psychosis in an asthmatic child: Case report & 10-year literature review. Can Child Adolesc Psychiatr Rev 2003;12:117-8.
2. Saag KG, Furst DE. Major side effects of systemic glucocorticoids. UpToDate. Available from: https://www.uptodate.com/contents/major-side-effects-of-systemic-glucocorticoids. [Last accessed on 2021 Mar 01].
3. Sirois F. Steroid psychosis: A review. Gen Hosp Psychiatry 2003;25:27-33.
4. Warrington TP, Bostwick MJ. Psychiatric adverse effects of corticosteroids. Mayo Clin Proc 2006;81:1361-7.
5. American Psychology Association, editor. Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5®). Arlington, VA: American Psychiatric Publishing; 2013.
6. Janes M, Kuster S, Goldson TM, Forjuoh SN. Steroid-induced psychosis. Baylor Univ Med Cent Proc 2019;32:614-5.
7. Mrakotsky C, Forbes PW, Bernstein JH, Grand RJ, Bousvaros A, Szigethy E, *et al*. Acute cognitive and behavioral effects of systemic corticosteroids in children treated for inflammatory bowel disease. Int Neuropsychol Soc 2013;19:96-109.
8. Kim JW, Kang KS, Kang NR. Steroid-induced psychosis in adolescent patient with Crohn's disease. J Korean Acad Child Adolesc Psychiatry 2020;31:161-4.
9. Ruemmele FM, Veres G, Kolho KL, Griffiths A, Levine A, Escher JC, *et al*. Consensus guidelines of ECCO/ESPGHAN on the medical management of pediatric Crohn's disease. J Crohns Colitis 2014;8:1179-207.
10. Hochhauser CJ, Lewis M, Kamen BA, Cole PD. Steroid-induced alterations of mood and behavior in children during treatment for acute lymphoblastic leukemia. Support Care Cancer 2005;13:967-74.
11. Folusho B, Adebowale A. Spectrum of behavioural abnormalities in children with nephrotic syndrome in South-Western Nigeria. JSM Clin Case Rep 2015;3:1088.
12. Hodgins GE, Saltz SB, Gibbs EP, Gonzalez R, Regan J, Nemeroff C. Steroid-induced psychosis in the pediatric population: A new case and review of the literature. J Child Adolesc Psychopharmacol 2018;28:354-9.
13. Mrakotsky CM, Silverman LB, Dahlberg SE, Alyman MC, Sands SA, Queally JT, *et al.* Neurobehavioral side effects of corticosteroids during active treatment for acute lymphoblastic leukemia in children are age-dependent: Report from Dana-Farber Cancer Institute ALL Consortium Protocol 00-01. Pediatr Blood Cancer 2011;57:492-8.

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