



A Rare Case of Psychosis Due to DiGeorge Syndrome and COVID-19

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Case Report Objectives

- Identify and describe the possible pathophysiology of COVID induced psychosis and DiGeorge syndrome induced psychosis
- Describe the typical course and medical management of psychosis in a patient with an intellectual disability
- Discuss the issues surrounding the intersection between natural remedies and evidence-based medical management

Clinical Overview

- DiGeorge Syndrome:^{1,2}
 - Microdeletion at 22q11.2, is an autosomal dominant immunodeficiency disorder.
 - Affects 1 in 4,000 people
 - Highest known genetic risk factor for psychosis (25-30%) and one of the highest risks for autism spectrum disorder (ASD)
 - This mechanism happens through the deletion of the COMT gene on the 11.2 regions of the long arm of chromosome 22. This leads to low COMT and increased dopamine levels in the prefrontal region.
- COVID-19:³⁻⁷
 - SARS-CoV-2 virus, a coronavirus subtype, is a novel virus that causes COVID-19.
 - Can cause psychosis and although the mechanism is still being researched, we can speculate its pathophysiology by looking at other coronavirus subtypes.
 - A coronavirus subtype that is an enveloped, nonsegmented, positive-sense, ssRNA virus.

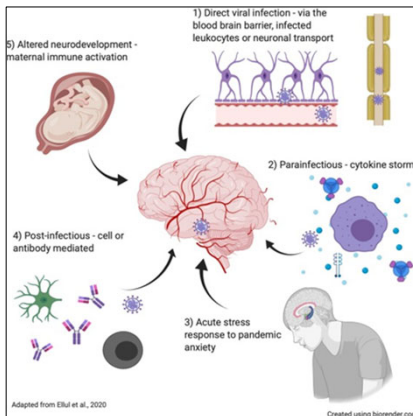


Figure 1

Clinical Case:

A 13-year-old white male with a past medical history of DiGeorge syndrome, COVID-19, and Autism spectrum disorder presented to the Emergency Department due to acute onset of psychosis early Nov 2021. Mid-October, the patient started having visual hallucinations with inappropriate laughter and tremors that lasted for a few days. The patient's parents were against traditional medicine so they took him to a homeopathic facility that gave supplements. His symptoms went away but his parents still described him as "not being himself". A couple of days before the current admission, the patient started having bizarre thoughts that were distressing to him leading his parents to bring him to the Emergency Department. Parents denied any previous visits to the ED of a similar presentation. The patient tested positive for a COVID infection in August 2021 but after discussing it with their physician, they made the decision to quarantine since it was a mild course. His symptoms later resolved. The patient had a head CT ordered at the Emergency Department which came back negative. The original plan was to have him admitted to Laurelwood Inpatient facility and evaluated but due to the patient's immunocompromised state, the parents were worried about microbial exposure which is when they were issued 1013, an involuntary hold, and C/L Psychiatry was consulted to assess the patient and decide if the patient was stable and safe for discharge.

<p>Mental Status Exam: <i>Consciousness:</i> Somnolence <i>Appearance:</i> clean, neat, wearing a hospital gown, intermittently sleeping in bed <i>Behavior:</i> sleeping <i>Attention and concentration:</i> sleepy <i>Eye Contact:</i> closed <i>Musculoskeletal:</i> no abnormal movement, tone, tremors <i>Speech and language:</i> hesitant to speak <i>Mood:</i> Anxious while intermittently awake Unable to assess rest of mental status exam</p>	<p>Workup: WBC 4.5 low EKG 8/24/16-QTc 482 prolonged Noncontrast CT 11/1/2021-no acute intracranial process identified Coronavirus COVID-19/FLU/RSV PCR 11/2/2021 Normal Toxicology Substance Panel-Negative</p> <p>Assessment/Plan: The patient was evaluated and deemed safe for discharge. Not in acute psychosis and the patient's parents had a safety plan in place. Recommended outpatient psychotherapy specializing in Autism. Following up with their outpatient psychiatrist consultation and their recommendations.</p>
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Supplements: saccharomycin df 500 mg, Xymogen optimag 125 mg, 200 mg, Taurine 500 mg, ProbioMax® Daily DF, B Complex 10 mg, Omega 3, Ultramax protein, and Master Supplements Bioactive TruFiber

Diagnostic Criteria and Management of Psychosis:^{8,9}

- Psychosis and Schizophrenia
 - Diagnosed clinically
 - Five major positive symptoms of psychosis are 1) unusual thought content/delusional ideas, 2) suspiciousness/persecutory ideas, 3) grandiosity, 4) perceptual abnormalities/hallucinations, and 5) disorganized communication
 - Brief Psychotic Disorder: <1 month
 - Schizophreniform: >1 month and <6 months
 - Schizophrenia >6 months
- 2nd generation antipsychotic + Psychotherapy
 - Pharmacology Take Home Points:
 - Recovery may be worse in those with severe intellectual disability so standard care alone may be less than optimal
 - Sensitivity to side effects from neuroleptic medications
 - Therapy Take Home Points:
 - Emotional contact is needed between provider and patient. Limited intelligence deterring them from the following treatment is a misconception and providers should be aware of this bias.
 - Limitations in communication skills may make speech therapy like CBT difficult

Discussion

- The concomitant factors of DiGeorge syndrome and COVID likely led to this patient's psychosis.
- The three out of the five ways COVID-19 may have caused psychosis in this patient: Direct viral spread, cytokine storm, post-infectious cell or antibody-mediated mechanisms.
- DiGeorge syndrome's decrease of COMT and excess dopamine levels in the prefrontal region gave the patient a predisposition to psychosis.
- Ideally, the usage of both psychopharmacology i.e. second-generation antipsychotics (i.e. risperdal, olanzapine, quetiapine, and aripiprazole) and psychotherapy is the best treatment
- It is unclear the role of the supplements. Whether it helped it, led to the 2nd episode, or had no effect remains unclear. More research needs to be looked into the effects of supplements and their role in psychosis, especially COVID-induced psychosis.

Conclusion

- The purpose of this study was: 1-help psychiatrists create an understanding of the pathophysiology of why this unique pediatric patient became psychotic. 2-discuss the balance of evidence-based medical management versus parental management.
- More research needs to be looked into the effects of supplements and their role in psychosis
- Look into the role of COVID-19 in other psychiatric conditions and compare with other countries

Acknowledgement

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