“Brain on Fire”: Anti-NMDA-Encephalitis in Pediatric Patient causing Gait Abnormality; A Case Report.

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Case Description

The patient initially presented to the hospital with complaints of gait abnormality and instances of seizure like activity as per mother. Approximately 10 days prior to admission, the patient reported a febrile incident (Tmax 101.8F). The following day, patient suffered from a seizure-like episode in which his upper and lower extremities stiffened for 10-15 seconds. While ambulating to school the patient noted increasing cramping in his lower extremities along with steppage gait. Pediatrician reassured family patient was suffering from a viral etiology however, the patient suffered a fall in the shower due to unbalance. Mother subsequently brought the patient to the emergency department. Initial head -CT negative for acute pathology. MRI-Brain found an incidental retro cerebellar cyst. Infectious work up positive for FluB. Further neurologic testing found significantly positive serum NMDA receptor AB (titer of 1:1280). Patient diagnosed with Anti-NMDA receptor (NMDAR) encephalitis. Of note, testicular U/S ruled out testicular tumor known for etiologic cause.

Asessment

During the hospital course, physical therapy was initiated for the patient’s inability to walk and ataxia. The patient was found to be modified independent with transfers and required a rolling walker to ambulate due to an unsteady gait. With presumed diagnosis of Anti-NMDAR encephalitis given the presence of antibodies and clinical symptoms, the patient received IV immunoglobulin treatments as well as pulse corticosteroids. Patient required 2 treatments of IV immunoglobulin treatments because he did not show significant improvement neurologically in regards to his mental status and gait. Patient required about 20 days of hospitalization. Patient functional status on discharge demonstrated supervision with rolling walker.

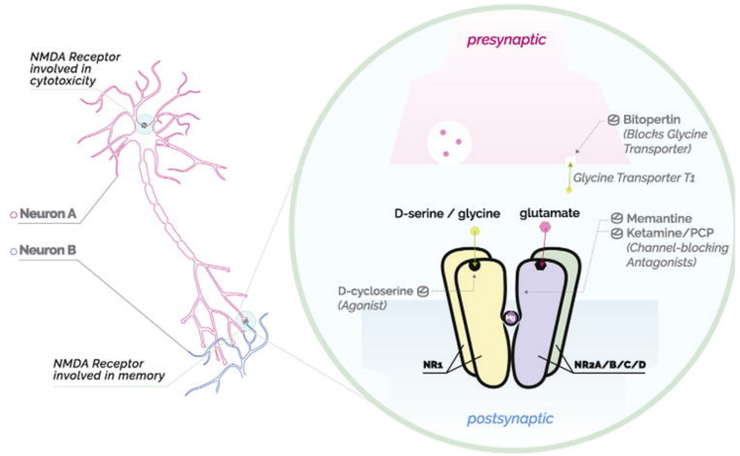

Figure 1: Structure of the *N*-methyl-D-aspartate (NMDA) receptor. On the left is a schematic of neuron A making synaptic contact with the dendrites of neuron B. Illustrated in the blue circles are NMDA receptors, demonstrating the distinct compartmental localization of somatic vs. dendritic NMDA receptors. Magnified on the right is the tetrameric structure of an NMDA receptor on the postsynaptic membrane of a synapse, along with the multiple agonists, co-agonists, and various targets for pharmacologic modulation. PCP, phencyclidine.[1]

Discussion

Anti NMDAR encephalitis is a rare autoimmune neurologic disorder that affects a patient’s mental status and can also cause a movement disorder as seen in this pediatric patient. Physical therapy in addition to immunotherapy improved the patient’s cognitive and functional status as seen during outpatient follow up. While the patient did not return to baseline, he will require further follow up to determine his baseline.

Conclusion

Anti-NMDAR encephalitis most often presents with changes in mental status, however may present with further neurological deficits such as gait disorder in the pediatric population. The initiation of physical therapy promptly in conjunction with IV immunoglobulin may play a significant role in the improvement in long-term functional status.

References

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