

Autoimmune meningoencephalitis associated with anti-glutamic acid decarboxylase antibody following covid-19 infection: A case report

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy

Mehri Salari¹, Bahareh Zaker Haroftteh¹, and Masoud Etemadifar²

¹Shahid Beheshti University of Medical Sciences

²Isfahan University of Medical Sciences

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Abstract

Anti-glutamic acid decarboxylase(Anti-GAD) are associated with various neurologic condition; but, no meningitis has been reported with it, so far. Evidence demonstrates the associated of autoimmune meningoencephalitis with Covid-19 infection. Here we report a 44-year-old female with progressive loss of consciousness with anti-GAD65 meningoencephalitis after Covid-19 infection.

Introduction

Anti-glutamic acid decarboxylase(GAD) are associated with various neurologic conditions, including stiff person syndrome, cerebellar ataxia, and limbic/extra-limbic encephalitis, seizure, cognitive impairment and behavioral disturbance(1–3). Growing evidence reveals the association of autoimmune meningoencephalitis with Covid-19 infection(4). Here we report a patient with anti-GAD65 autoimmune meningoencephalitis, post Covid-19 infection.

Case presentation

A 44-year-old female known case chronic bronchitis who was admitted by respiratory distress one months ago, and received Remdesivir by diagnosis of COVID-19 infection, after 10 days she discharged with clinical improvement. Twenty days after disease onset, the patient gradually developed memory loss and confusion, therefore, she admitted again. On examination she was confused without any focal neurological deficits, she did not have fever and meningeal irritation. Her pupils were isochoric and reactive and plantar reflex were down going. Brain CT showed severe hydrocephalus (figure 1). Brain MRI did not show any other pathologies. Lumbar puncture was done and CSF analysis revealed high protein, low glucose and pleocytosis (Table 1) and treatment with ceftriaxone (2gr/BD) and vancomycin (1gr/BD) got started and we continued the treatment. Due to severe hydrocephalus brain extra ventricular drainage was done for her. The EEG showed generalized slow activity. CSF evaluated for fungal, tuberculosis, brucellosis, sarcoidosis, and viral infections including HSV-1,2 and CMV, and autoimmune antibodies, and they came back positive for anti-GAD65 (Table 1). Malignancy and vasculitis work-up were negative. Due to the negative CSF culture, antibiotics discontinue and was started 7-day course of 1g/day IV methylprednisolone and she responded very well to medication and became conscious again and oriented without hallucination and illusion. Unfortunately, patient had pulmonary thromboembolism(PTE) in hospitalization and she died.

Discussion

Neurological manifestations are reported in 6-36% of patients with Covid-19. They could be divided in to direct(viral), secondary and post (para) infections(autoimmune)(5). Studies carried out since the Covid-19 outbreak have revealed conflicting statistics on the incidence of meningoencephalitis in various countries(6). It may be speculated that cases of meningoencephalitis related to Covid-19 may not actually reflect direct viral invasion to CNS, post-/para-infection immune pathologies might come in to play in some of the clinical presentations(7). 28 articles reporting 48 patients with infectious or immune-mediated Covid-19 CNS-disease, 5 patients presented with meningoencephalitis and 11 cases with autoimmune encephalitis(8). Zamani et. al, 2021 conducted a systematic review of 26 case reports on Covid-19 related meningoencephalitis that all patients presented with altered mental status and mild/moderate pleocytosis or proteinorrhachia in CSF (4). Anti-GAD antibody is found in some neurological syndromes, including stiff-person syndrome (60-80%), Limbic encephalitis (17%), cerebellar ataxia (2%), epilepsy (2.1-5.4%) and Miller Fisher syndrome, eye movement disorders, palatal myoclonus and Parkinson's disease rarely occur(9–11). But, no cases have reported with anti-GAD65 meningitis, so far (Table 2). The interesting finding of our case is presentation of GAD-65 with meningoencephalitis after Covid-19 infection.

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Conflicts of interest

The authors declare no conflict of interest.

Ethics statement

Written informed consent was obtained from sister of the patient to publish this report in accordance with the journal's patient consent policy.

Detailed author's contribution

All the authors have contributed equally to conception, design, manuscript preparation, critical revision, and finalization. All the authors agree to be accountable for all aspects of the work.

Data availability statement

The authors confirm that the data supporting the finding of this study are available within the article

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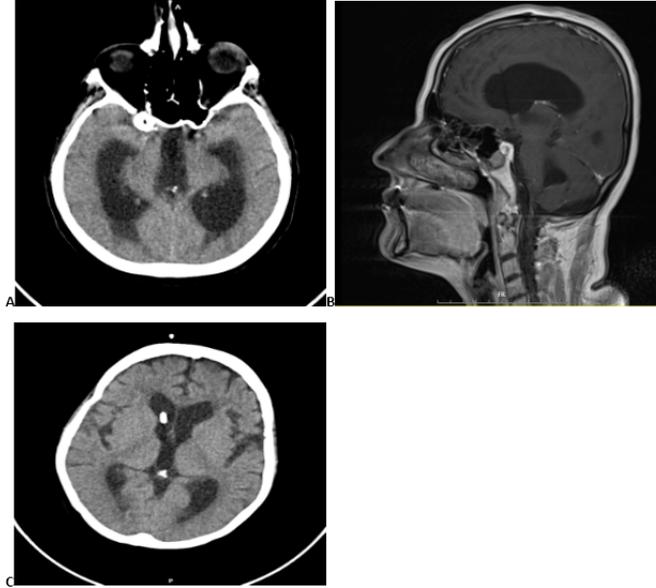


Fig. 1; A: Axial view Brain CT without contrast demonstrates severe hydrocephalus before extra ventricular drainage. B: Sagittal view Brain MRI(T1) with gadolinium did not any other pathologic without hydrocephalus. C: Axial Brain CT without contrast after extra ventricular drainage, that shows hydrocephalus was reduced.