



A Rare Case Of Acute Haemorrhagic Leukoencephalopathy in COVID 19 patient.

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Abstract

Acute haemorrhagic leukoencephalitis (AHLE) is an inflammatory immune related disorder characterised by a rapid onset of encephalopathy and multifocal neurological features.

Acute haemorrhagic leukoencephalitis (AHLE) is considered a rare form of acute disseminating encephalomyelitis (ADEM)

In this case report we include a case of AHLE in a 47 year old female with its clinical and radiological manifestation, process of diagnosis, management and prognosis.

A 47 year old female known case of sickle cell disease was admitted to tertiary care hospital at Raipur with history of self-fall followed by loss of consciousness. She also had history of COVID-19 infection 1 month back.

She was diagnosed with AHLE and was treated with steroid therapy, antibiotics, LMWH and other symptomatic treatment.

AHLE is a rare and severe post- infective demyelinating disease, mortality and morbidity of which can be decreased by early detection and treatment.

Keywords: NIL

Introduction

Acute haemorrhagic leukoencephalitis (AHLE) is an inflammatory disease of brain, most often affecting the cerebrum, less commonly the cerebellum, the brain stem, or the spinal cord. Weston hurst was the first to describe this syndrome in 1941. AHLE, a monophasic demyelinating disease and a hyper-acute severe form of ADEM, is a rare clinical entity with a poor prognosis. There is antecedent history of viral or bacterial infection in 50–75% of patients, with most cases following an upper respiratory tract infection. The etiology of AHLE is unknown. The initial emergence of flu like symptoms, however, supports the hypothesis of an autoimmune process on the basis of molecular mimicry promoted by mostly viral or bacterial pathogens. CSF analysis reveals elevated proteins and lymphocytic pleocytosis. Typical

neuroimaging features include multifocal, variable-sized, poorly defined cerebral white matter lesions with cortical sparing. Involvement of the brainstem, cerebellar peduncles, and deep grey matter can also occur, although rarely. Lesions are hyperintense on T2-weighted (T2W) and fluid-attenuated inversion recovery (FLAIR) images, hypointense on T1W images, and show microhemorrhages, variable diffusion restriction, and post-contrast enhancement. Extensive microhemorrhages, brainstem involvement, and gross hemorrhage often portend a poor prognosis. The ongoing coronavirus disease 2019 (COVID-19) pandemic caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has resulted in morbidity and mortality on an unprecedented scale. Of the different neurological complications encountered in COVID-19 patients, a

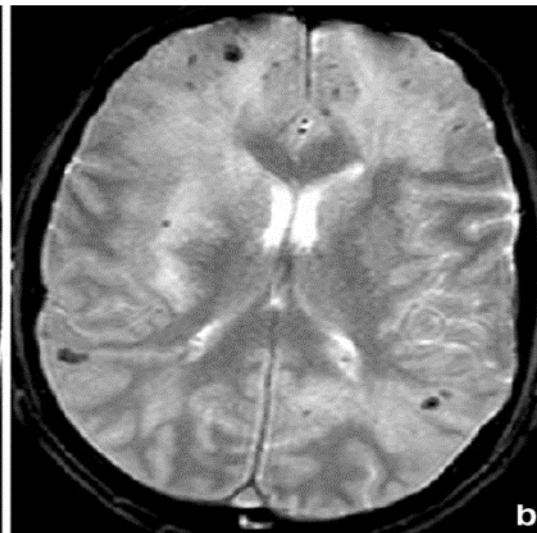
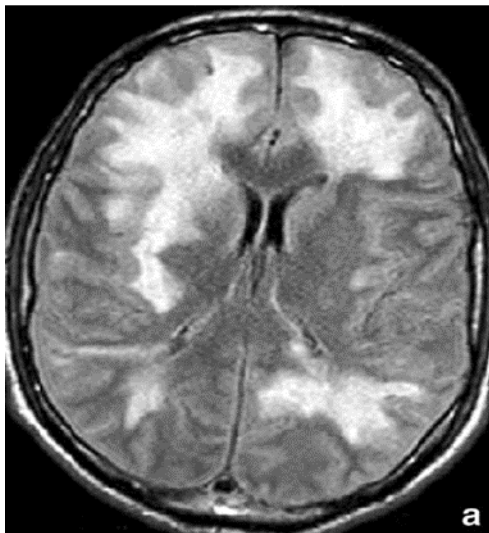
few can be fatal, and AHLE is one of them. Heightened awareness about the clinical and imaging presentation of COVID-19-related AHLE can positively alter the outcome in a select few by enabling early diagnosis and aggressive management.

Case Presentation :

1. A 47 year old female presented with history of self-fall at home followed by complaints of slurring of speech and blurring of vision which progressively increased followed by loss of consciousness within 3 hrs of fall. There were no complaints of headache, body ache, chest pain, nausea.
2. At presentation, patient was unconscious with GCS 7 (E2V2M3). Patient had history of cough, cold, fever for 3 days. She was tested positive for COVID 19 by rapid antigen testing one month back and was admitted for same. She had CT severity score of 06/25 and CORADS IV. She

was treated symptomatically and was discharged after 2 weeks. She is a k/c/o sickle cell disease. No other comorbidities

3. On examination:- Vitals were stable and oxygen saturation was 88% on room air. She was unconscious with GCS 7 (E2V2M3).
4. Blood Investigations: It revealed raised TLC of 10,200/ μ l with DLC of N88 L5, D dimer-3333ng/ml. Radiological Investigations:- X-ray chest PA view revealed B/L consolidation which was suggestive of pneumonitis. NCCT head was done which was normal. MRI brain was done and showed many small T2 FLAIR hyperintensity in bilateral thalamus and basal ganglia, few tiny foci of susceptibility on GRE in subcortical white matter of bilateral cerebral hemisphere, pons, and cerebellar hemisphere s/o acute haemorrhagic encephalopathy/ critical covid related illness.



5. CSF analysis:- It revealed 10 WBCs with 100% lymphocytes, Protein-46 mg/dl, Sugar-80 mg/dl and no growth on culture.
6. Management:- She was started on Inj. Methylprednisolone 1gm OD, Inj. Mannitol 100ml TDS, Inj. Low Molecular Weight Heparin 60mg OD, Antibiotics for pneumonitis, I. V. Fluids and Symptomatic treatment was given. She was monitored continuously in case she required intubation and ventilator support but she maintained oxygen saturation with oxygen mask and flow at 6 ltrs/min. Intubation and ventilator support was not required.

7. Patient slowly regained consciousness after 1 week of treatment. Her Blood parameters improved. D-dimer values started decreasing after initiation of treatment and eventually came to normal after 3 weeks of treatment. Her condition improved gradually, and she was discharged after 3 weeks. There was no residual neurological deficit at the time of discharge.

Discussion :

This is a case of AHLE in critically ill COVID-19 patient. Patient's neuroimaging findings are compatible with AHLE, other important differentials

were also considered. SARS-CoV-2 can potentially exploit Angiotensin Converting Enzyme 2 receptors to enter capillary endothelium of cerebral vasculature and cause endothelial inflammation. Hypoxia, sepsis and ischemic stroke are among the relatively more common entities that can cause acute neurological deterioration In COVID19 patients. Other white matter diseases (ADEM, AHLE), Necrotizing encephalitis (ANE), and vascular disorders like cerebral venous sinus thrombosis (CVT), Haemorrhagic posterior reversible encephalopathy syndrome (PRES) have a much lower incidence but overlapping clinical manifestations. Hence a combination of imaging, CSF analysis, and histopathological evaluation help to narrow the differential.

In addition, reports have recently surfaced demonstrating diffuse leukoencephalopathy, microhaemorrhages located predominantly in the corpus callosum and juxtacortical regions, and cortical signal abnormalities on MRI in critically ill COVID-19 patients. Although Lumbar Puncture was performed, the likelihood of ongoing direct viral neuroinvasion was considered low, given that she had achieved clearance of SARS-CoV-2 from other clinical sites, and most reported cerebrospinal fluid analysis in the literature have not detected presence of virus

Furthermore, the asymmetry and entire distribution of lesions (subcortical white matter, cortex, thalami and cerebellar hemispheres), with incomplete ring contrast enhancement favoured AHLE as diagnosis.

Conclusion:AHLE is a rare and often fatal neurological complication of COVID-19. Heightened clinical suspicion and early imaging identification of this entity can enable the clinicians to pursue more aggressive treatment options thereby reducing fatal outcomes.

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