

## Covid19-9 Infection Induced Hydrocephaly: A Case Report and Review the Article

Amir Kamalifar<sup>1\*</sup>, Firooz Salehpour<sup>2</sup>, Farhad Mirzaii<sup>2</sup>, Samar Kamalifar<sup>3</sup> and Ebrahim Rafeei<sup>2</sup>

<sup>1</sup>Department of Neurosurgery, Urumia University of Medical Sciences, Urumia, Iran

<sup>2</sup>Department of Neurosurgery, Tabriz University of Medical Sciences, Tabriz, Iran

<sup>3</sup>Student Research Committee, Arak University of Medical Sciences, Arak, Iran

\*Corresponding Author: Amir Kamalifar, Department of Neurosurgery, Urumia University of Medical Sciences, Urumia, Iran.

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### Abstract

Covid19-9 can be presented with various neurological problem like headache, dizziness, anosmia...and sometimes was make disaster situation like intracranial hemorrhage. We report 32 years old woman with post covid19-9 infected late onset hydrocephaly.

**Keywords:** COVID19-9; Hydrocephaly; Altered Conscious

### What is "already known" in this article

Covid19-9 infection can induce neurological problem like headache dizziness,...and this sign an symptom can be complicated the patients situation.

### What is the article add

One of covid19-9 infection sign can be hydrocephaly which was life treating and need emergency work up.

### Introduction

Covid19-9 as a pandemic infection nearly infected more than 130 million individuals and manifested with various sign and symptom [1], breathing system major part was involved but in period of pandemic many article released about the other organs infection with various sign and symptom. Anosmia was popular sign of CNS manifestation during of infection, but headache, dizziness, impaired consciousness, acute cerebrovascular disease, epilepsy also can be seen in infected patients [2,3]. Some symptom like headache and dizziness can be worsen in patient with sever covid19-9 infection, due to respiratory failure or hypoxia [4]. Al-

tered conscious level was reported in elderly patients who infected severely, cerebrovascular accident like hemorrhagic or thrombotic stroke was reported maybe due to intrinsic coagulation and anticoagulation imbalance [5], in other hand dysfunction of ACE-2 receptor in cerebral arterial endothelial cell during covid19-9 infection can't be ignored [6], Acute necrotizing encephalopathy (ANE) and encephalitis with covid19-9 was also reported in literature [7], in this article we present 32 years old woman with sever hydrocephaly due to post covid19-9 infection.

### Case Presentation

A 32 years old women admitted to hospital with headache and confusion and vomiting from last night, in initial assessment vital sign was normal (BT=36.4,RR=13,BP=100/70,PR:81), she was confused and bilateral papilledema significant finding, nuchal rigidity and kernik and brodensky was negative, blood sample analyzed (See table), patient go under brain non contrast spiral computed tomography (CT) significant ventriculomegaly and periventricular edema without any mass lesion was reported, for future evaluation lumbar puncture was done in lateral decubitus position CSF pres-

sure 23 cm H<sub>2</sub>o and CSF sample analyzed for biochemical compound and cell count and cytology (Table), patient go under emergency brain MRI without contrast, significant ventriculomegally and periventricular edema without any mass lesion or occupying lesion, in past medical history last month she be quarantine in home because of positive covid19-9 PCR test, and passed 14 days in home with acetaminophen 500 mg/q8h, past drug history was negative, patient go under close external ventricular drainage (EVD), after 8 hours she extubated, conscious level was normal without any vomiting episode, we also analyzed CSF sample for TB PCR test and HSV-1, CSF culture was done for aerobe, anaerobe infection and fungal at least for 1 week in 3 sample. Brain MRI with contrast and brain MRA, MRV also done every evaluation was negative to infection and occupying lesion to can refereed the hydrocephaly, after one week we change the EVD catheter with ventriculoperitoneal shunt and patient discharge in healthy state.

| Blood sample item | Result    |
|-------------------|-----------|
| WBC               | 5000-7000 |
| Hb                | 13.1MG/DL |
| Plt               | 275000    |
| BS                | 105mg/dl  |
| CRP               | 6         |
| ESR               | 5         |
| Na                | 143       |
| K                 | 4.1       |

**Table 1:** Blood sample analysis.

| CSF item | Result                           |
|----------|----------------------------------|
| Glucose  | 67mg/dl                          |
| Protein  | 46mg/dl                          |
| WBC      | Negative                         |
| RBC      | Negative                         |
| Cytology | Negative for malignancy          |
| VDRL     | Negative                         |
| Culture  | Negative after 6 days incubation |
| TB(PCR)  | Negative                         |

**Table 2:** CSF sample analysis.

**Figure 1**

Line 1: Coronal T1 MRI without contrast show ventriculomegally in lateral ventricle.  
 Line 2: Sagittal and axial T2 MRI show dilation of lateral ventricle and widening of temporal horn.  
 Line 3: Axial flair MRI show dilation of lateral ventricle with periventricular edema.

**Discussion**

covid19-9 infection word –wild concern which affected all individuals. SARS-COV-2 infection known with acute respiratory failure and fever in last 16 month researcher try to declare other system infection problem, CNS sign and symptom manifestation wide varied from headache to ANE and hemorrhage, scientist guess CNS involvement can be direct or indirect infection [6,7]. Disruption of BBB through release of cytokine and invading of cerebral tissue and manifested by encephalitis in addition hypoxia and immune system mediated nerve injury other theory, recently ACE-2 receptor more favorable molecule in study of covid19-9 pathogenesis, ACE-2 receptor usually found in arterial wall cells and regulate arterial pressure, spike protein of covid19-9 can interact with ACE-2 receptor and induced blood pressure and arterial disruption specially in fine vessels [8], in other hand Jacomi., *et al.* declared the covid19-9can invade to brain stem neural cell and damage cardio-respiratory regulation center which can make severe respiratory failure and hypoxia [9], we report acute hydrocephaly in 32 years old women due to covid19-9 infection, maybe our patient have arrested hydrocephaly which decompensated with cerebrit of virus

other theory it was direct infection of arachnoid villi can decrease absorption of CSF and hydrocephaly be presented this sentences just theoretical, maybe not true and need to future study.

### Conclusion

During of covid19-9 infection physician should be alter about the wide spectrum neurological sign and symptom of infected patient. And consecutive neurological examination in survived can be helpful to find late onset neurological problem.

### Compliance with Ethical Guideline

All steps of this article reviewed by Tabriz university of medical science ethical committee, ethical code ir-tmsu. rec1399.4325/7654.

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### Conflict of Interest

The author declare that they have no competing interest.

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