

# Posterior reversible encephalopathy syndrome as a sequela of COVID-19 infection

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**ABSTRACT**

Posterior reversible encephalopathy syndrome (PRES) is the rare manifestation of Covid-19 infection. It is previously reported in severe cases of Covid infection or in the presence of other conditions that can be an associated factor for development of PRES. We present a case of Non Severe Covid Infection that presented with headache and visual loss diagnosed as PRES and on incidental finding Covid infection was picked up and proposed to be a cause of this syndrome.

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**INTRODUCTION**

Neurologic manifestations of Covid-19 infection are becoming increasingly recognized and have been described in significant percent of patients.<sup>1</sup> They can result from virus affinity with functional angiotensin converting enzyme 2 (ACE-2) receptors present in brain. Hypoxia or immune-mediated injury leading to endothelial dysfunction may contribute to neurological sequelae of Covid-19 infection. It can lead to a rare manifestation like PRES.<sup>1</sup>

Posterior reversible encephalopathy syndrome (PRES) is characterized by symptoms such as headaches, seizures, altered sensorium, and visual changes, nausea/vomiting and focal neurological deficits.<sup>1</sup> Brain imaging usually shows foci of symmetrical hemispheric edema mostly affecting the parietal and occipital lobes. The treatment of PRES usually includes treatment of precipitating factor(s). Cerebral vasogenic edema is the pathological mechanism behind these symptoms. PRES is associated with diverse conditions including uncontrolled hypertension, preeclampsia, eclampsia, cytotoxic / immunosuppressive drugs, and sepsis.<sup>2,3</sup>

Here we present the case of a 50-year-old female who developed PRES in 2nd week of Covid-19 infection.

**CASE REPORT**

A 50-year-old diabetic and hypertensive female presented to Emergency Department on September 6, 2021, with acute onset severe headache, nausea,

vomiting, visual blurring and a low-grade fever for the last 5 days. She had a history of non-productive cough and a low-grade fever that had settled within 3 days after taking acetaminophen. On presentation she was vitally stable maintaining oxygen saturation of 96% on room air. There were no focal neurological deficits, signs of meningism were absent, a fundoscopic examination was also normal, and systemic examination was unremarkable.

On investigation she had an elevated leukocyte count of 22000, (Neutrophils 87%, Lymphocytes 7.3%) C-reactive protein was 32, Serum Electrolytes showed a Sodium level of 128. Procalcitonin was normal, Urine R/E and CSF examination showed normal results. On admission Covid PCR was also negative along with serological testing for dengue and malarial parasite. Chest x-ray done as part of routine workup showed few infiltrates bilaterally. A High-resolution CT Chest was performed that showed patches of consolidation and ground glass haze in bilateral lungs, suggestive of COVID pneumonitis (Figure 1).

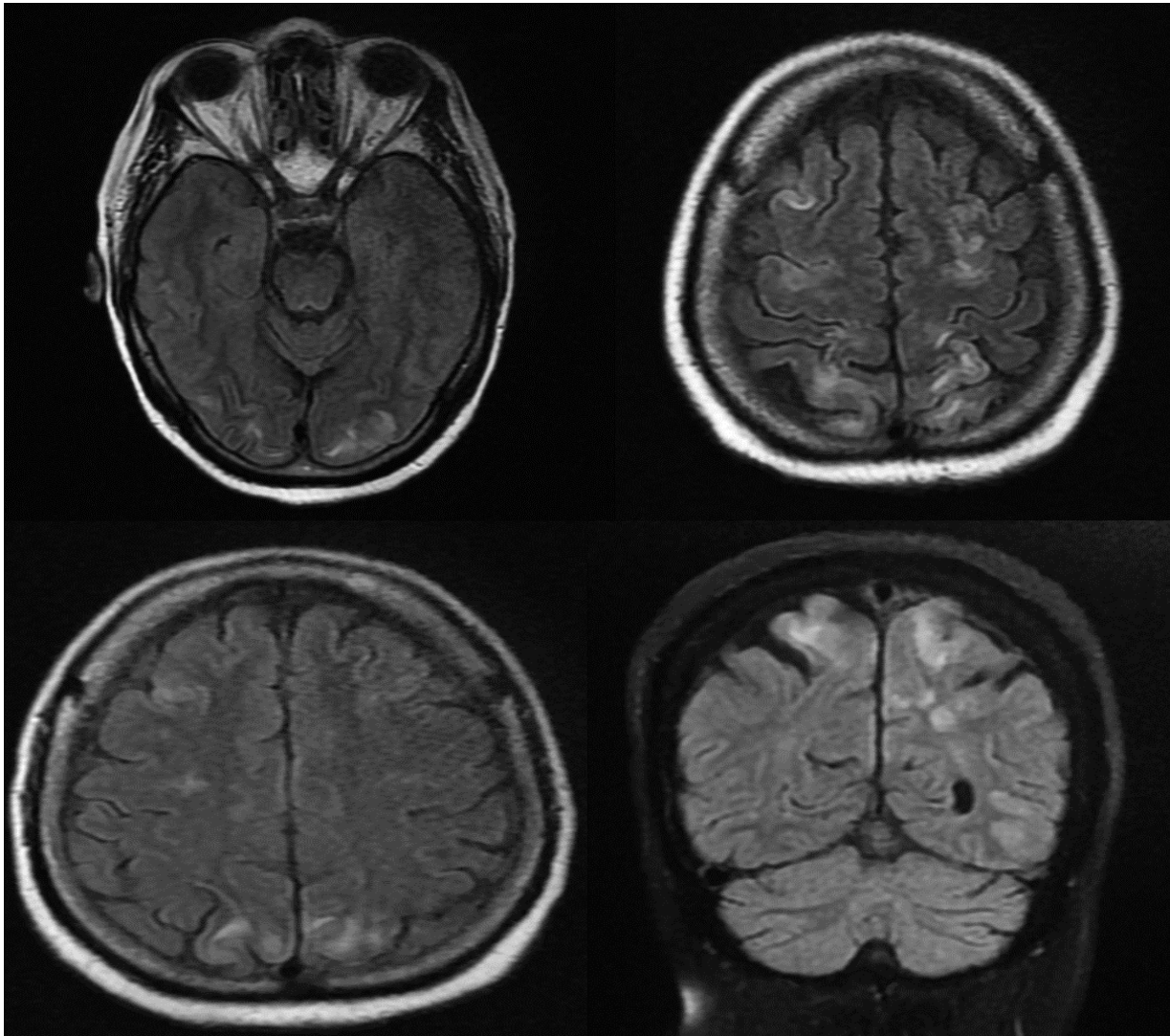


**Figure 1:** High-resolution CT Chest showing patches of consolidation and ground glass haze in bilateral lungs.

For evaluation of headache and visual symptoms, an MRI Brain was done that showed multiple abnormal hyperintense signals in bilateral fronto-parieto-occipital lobes at grey-white matter junction evident on flare images. There was no restrictive diffusion on DWI/ADC Map. No GRE blooming was seen consistent with posterior reversible encephalopathy syndrome (Figure 2).

Based on this clinical data the clinical diagnosis of PRES secondary to COVID 19 infection was made. The patient was given standard treatment for Covid along with supportive care.

Her symptoms start to settle in couple of days, she was discharged on 9<sup>th</sup> September 2021. On follow up after 2 weeks her symptoms were completely resolved.



**Figure 2:** MRI Brain showing multiple abnormal hyperintense signals in bilateral fronto-parieto-occipital lobes at grey-white matter junction evident on flare images.

## DISCUSSION

Neurological manifestation especially PRES is thought to be related to endotheliopathy caused by Covid 19 infection resulting in brain edema.

There are some peculiar features of our case that differentiate it from the other few reports published so far. Firstly, to our knowledge this is the first case reported from Pakistan. Secondly, we reported a case of PRES in non-severe Covid infection. Our case fell into category of moderate Covid infection, the cases reported so far are all from severe Covid infection with hypoxic states requiring ventilatory support, widespread sepsis, Multiorgan failure and receiving polytherapy.<sup>2</sup> A recently published case from the USA documented this syndrome in a patient of sickle cell disease who developed Covid infection.<sup>4</sup> In these cases definitive etiology behind PRES face strong confounder bias like hypoxia, sepsis, tocilizumab therapy etc.<sup>2</sup>

In another report, PRES was documented in a female having history of breast and endometrial cancers who developed Covid-19 infection; in this report although the disease was non severe hence the use of chemotherapeutic agents can be a factor contributing to the development of syndrome.<sup>1</sup>

Recently one case report was published describing PRES in non-severe Covid, but that patient was hypertensive as well, which may serve as a confounding factor in making association between covid and PRES.<sup>5</sup>

In our case, the patient was not oxygen dependent and no other cause was identified so PRES was probably due to virus related endothelial damage.

## CONCLUSION

Our case is essentially an example of PRES in the setting of non-severe covid disease where one can consider the virus as a sole culprit.

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