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## Letter to Editor



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## A rare fatal case of rabies coexisting with COVID-19

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Rabies is a zoonotic disease that affects the central nervous system (CNS) of humans with an extremely high mortality rate. This disease is transmitted to humans through the bite of rabid animals, usually dogs. Post-exposure prophylaxis (PEP) is recommended for all rabid animal bites. If delayed or missed there is a very high chance of developing the disease which is almost always fatal. About 55 000 human rabies-related deaths are reported due to delayed or deferred rabies PEP in the world annually<sup>[1]</sup>. The public usually ignores earlier indicators of rabies and is unwilling to consult a doctor, to avoid contracting COVID-19 during hospital visit<sup>[2]</sup>. We present a case of human rabies infection due to non-compliant PEP amid the COVID-19 pandemic following a rabid dog bite.

Informed consent has been taken from the next of kin of patient for publication and approval has been taken from institutional ethical committee.

A 24-year-old male patient presented to the hospital with fever and flu-like symptoms of two days duration. Amid this COVID-19 pandemic, the patient was admitted to an isolation ward as a suspect, and a nasal swab was sent for real-time PCR. He reported a history of a dog bite (category 3) over the right lower limb 13 days before the admission and poor compliance with the PEP. He stopped taking the vaccine after the first two doses in fear of COVID-19 exposure while going to the hospital for vaccination. He did not receive any passive immunization as well. On 3rd day after admission, the patient deteriorated and developed excessive salivation and ascending paralysis starting from the affected limb confirming the diagnosis of rabies clinically. However, the progression was rapid and developed altered sensorium associated with paralysis of chest and neck muscles. The breathing was rapid and of low tidal volume with arterial gas analysis suggestive of carbon dioxide (CO<sub>2</sub>) retention (pH of 7.34, PCO<sub>2</sub> of 60, PO<sub>2</sub> of 92, and HCO<sub>3</sub> of 23). He was intubated and placed on a mechanical ventilator to prevent

aspiration and hypercapnia. Real-time PCR for nasopharyngeal swab came positive for COVID-19. He received immediately steroid therapy and low molecular weight heparin. On day 5 of admission, he developed severe hyperthermia and hypotension refractory to all supporting therapy and succumbed to the illness.

After the development of clinical symptoms, rabies is invariably fatal. This disease has two unique features: first, the time of exposure is usually well established; second, the incubation period is often sufficiently prolonged so that active immunity can be produced before the invasion into the central nervous system by the virus. This makes PEP so important in the management of a case of a dog bite. Rare literature can be found regarding cases of COVID-19 positive patients along with rabies. Whether there is any effect of the COVID-19 virus on the progression of rabies is not clearly understood. Rabies is almost completely preventable with PEP. Per World Health Organization recommendations, PEP consists of local treatment of the wound, followed by a course of rabies vaccine (with or without rabies immunoglobulin). It should be initiated as soon as possible whenever a person gets bitten by a suspected rabid animal or there is contact of saliva with non-intact skin or mucous membranes. Treatment may be discontinued if the suspected animal

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can be observed for 10 days and remains healthy throughout the duration or if the animal is found to be rabies negative through testing of brain tissue. However, there may exist many barriers to PEP like distance from facilities and cost of treatment that often lead to failure to seek or receive PEP and serve as the major cause of death. The present-day COVID-19 pandemic posted a lot of challenges to the existing problems. Most of the patients do not visit the healthcare facility for immunization or they stop the treatment after a few visits due to the fear of the contagion rather than the virulent virus as in our case.

Histopathological studies on the human brain may show Negri inclusion bodies but it is not as common in human being as they are in other mammals[3]. Negri bodies are presented in more than 70% of infected human or animal brains[4]. Hence the decision to autopsy for confirmation of rabies in a COVID-19 positive patient may not be a wise decision when the clinical picture is so evident[5].

Along with the severity and rapid progression, our case highlights the deficiencies in public education and awareness that can contribute to preventable deaths. Though the disease has become rare, there still is a need for awareness campaigns for the general public on the response to potential rabies exposure, to reduce the impact of this almost always mortal but almost preventable disease. Hence reporting such cases is important for continued awareness regarding the lethality of the illness and the importance of PEP in preventing deaths.

### Conflict of interest statement

The authors report no conflict of interest.

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### Authors' contributions

R.N.H.: Clinical management and manuscript preparation; S.S.: editing and review manuscript; R.S. and P.K.: Literature Search, data acquisition, and analysis.

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