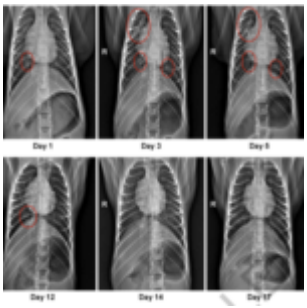
Respiratory disease and viral shedding in rhesus macaques inoculated with SARS-CoV-2



After SARS-CoV and MERS-CoV, SARS-CoV- 2 is the third coronavirus capable of causing severe respiratory disease in the human population to emerge in the past 17 years (1, 2).Although data on disease in humans are emerging at a steady pace, certain aspects of the pathogenesis of SARS-CoV-2 can only be studied in detail in animal models, where repeated sampling and tissue collection is possible.

Munster, et al. showed that SARS-CoV-2 causes respiratory disease in infected rhesus macaques, with disease lasting 8-16 days (3). Pulmonary infiltrates, a hallmark of human disease, were visible in lung radiographs of all animals. The shedding pattern observed in rhesus macaques was strikingly similar to that observed in humans (4,5). In humans, consistent high SARS-CoV-2 shedding was observed from the upper and lower respiratory tract, frequent intermediate shedding from the intestinal tract and sporadic detection in blood (6).

High viral loads were detected in swabs from the nose and throat of all animals as well as in bronchoalveolar lavages; in one animal the authors observed prolonged rectal shedding. Similar to what has been observed in humans, shedding of SARS-CoV-2 continued after resolution of clinical symptoms and radiologic abnormalities (7).

They also studied the histopathological changes observed in rhesus macaques. Their findings suggests that they resemble those observed with SARS-CoV and MERS-CoV (8,9) with regard to lesion type and cell tropism.

Taken together, the rhesus macaque recapitulates moderate disease observed in the majority of human cases. The authors thinks that the establishment of the rhesus macaque as a model of COVID-19 will increase our understanding of the pathogenesis of this disease and will aid development and testing of medical countermeasures i.e to test antiviral treatments and vaccines in this model (3).

References

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