

Immunotherapy could be answer to treating novel coronavirus

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medwireNews: Investigation into the mechanism of action of the novel coronavirus HCoV-EMC, which recently emerged in the Middle East, has revealed that although human bronchial epithelia are very susceptible to infection with the virus, interferon I and III were both able to significantly reduce its replication in cell culture.

HCoV-EMC is associated with similar symptoms to severe acute respiratory syndrome (SARS), such as fever, cough, and breathing difficulties. It is also believed to have a zoonotic origin, because it is closely related to bat coronaviruses.

Human airway epithelium (HAE) is a common infection target for respiratory viruses. Using an HAE cell culture, Ronald Dijkman (Institute of Immunobiology, Kanton Hospital, St Gallen, Switzerland) and colleagues investigated the mechanism of infection of HCoV-EMC and assessed possible treatments for the virus.

HCoV-EMC was easily able to infect the HAE cells and “like other coronaviruses, evades innate immune recognition, reflected by the lack of interferon and minimal inflammatory cytokine expression following infection,” write Dijkman and team in mBio.

Notably, treatment with interferon I and III – cytokines able to interfere with the replication of certain viruses – significantly reduced the viral load in the infected HAE cells.

The researchers hope their findings will help scientists develop a treatment for HCoV-EMC.

To date, only 12 cases of the virus have been confirmed in the laboratory (five in Saudi Arabia, four in the UK, two in Jordan, and one in Germany), although co-author of the study Volker Thiel, also from the Institute of Immunobiology at the Kanton Hospital, believes more people may be infected.

“We don't know whether the cases we observe are the tip of the iceberg,” says Thiel in a press statement. “Or whether many more people are infected without showing severe symptoms.”

The latest case, reported in a family member of someone who developed the virus after traveling to the Middle East, seems to be a result of human-to-human infection, because the patient had not recently travelled out of the UK.

John Watson, head of the respiratory diseases department at the Health Protection Agency (HPA) in the UK, told the press: “Although this case appears to be due to person-to-person

transmission, the risk of infection in contacts in most circumstances is still considered to be low.”

He added that if the virus were more infectious “we would have expected to have seen a larger number of cases than we have seen since the first case was reported three months ago.”

Concern has been expressed that HCoV-EMC could cause an epidemic like the 2002–2003 SARS epidemic, which infected more than 8000 individuals and caused almost 800 deaths. The small number of cases since the first reported infection in June 2012 suggests this is an unlikely scenario, but agencies such as the HPA and the World Health Organization (WHO) remain vigilant.

By Helen Albert, Senior medwireNews Reporter

Reference

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