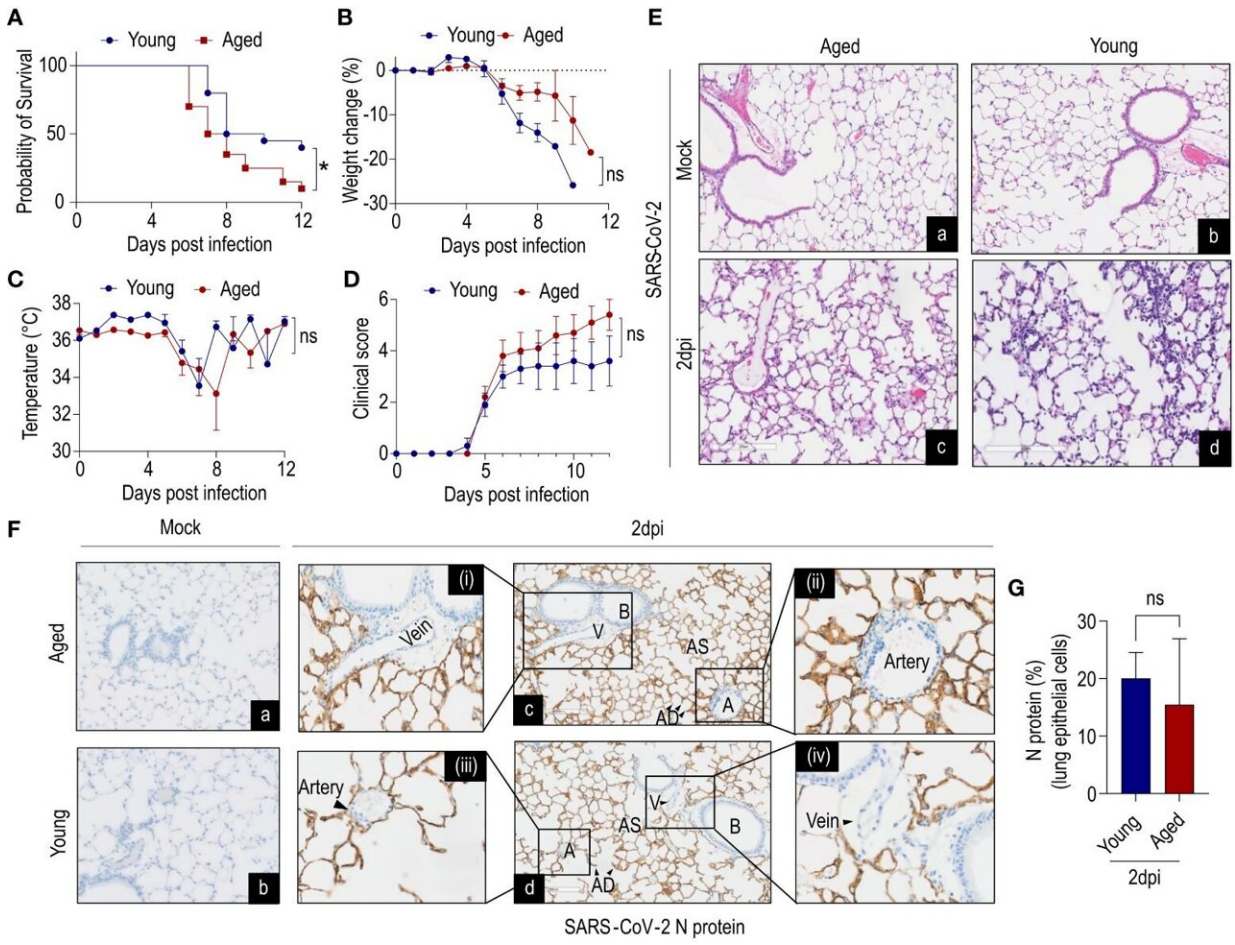
New study helps explain how elderly individuals react differently to COVID-19 than young people

June 10 2024



Age-dependent clinical decline of SARS-CoV-2-infected humanized ACE2 mice. K18-hACE2 mice young (12–15 weeks) and aged (85–112 weeks) were inoculated intranasally with $1x10^4$ plaque-forming units (PFU) or received saline (mock). Credit: *Frontiers in Immunology* (2024). DOI:

10.3389/fimmu.2024.1397990

The COVID-19 pandemic resulted in over 700 million infections and 7 million deaths worldwide. While age is recognized as a risk factor for severe COVID-19, the reasons for this are not yet fully understood.

A new study by researchers at Boston University Chobanian & Avedisian School of Medicine suggests that the immune response of lung endothelial cells, which line the blood vessels, is too low during the early stage of COVID-19 infection as demonstrated in a preclinical model. Additionally, the researchers analyzed all genes expressed in purified endothelial cells, which had never been done before.

"The susceptibility to SARS-CoV-2 infection increases proportionally with age, placing older individuals at a significantly higher risk of developing severe COVID-19. Therefore, gaining insight into age-dependent pathological changes during SARS-CoV-2 infection is imperative for effectively safeguarding vulnerable populations," says corresponding author Markus Bosmann, MD, associate professor of medicine, pathology & laboratory medicine at the school.

The researchers used four groups of endothelial cell conditions with susceptibility to SARS-CoV-2. The first two groups, consisting of young and old models, remained uninfected as controls. The other two groups, also young and old, were infected with SARS-CoV-2.

Endothelial cells from all sets of conditions were isolated after two days, and their transcriptomes (their expressed genes) were analyzed and classified as biological programs of the host response. The clinical severity of infection was monitored and found to be more severe with advanced age.

According to Bosmann, a suppressed immune landscape is a key driver of age-associated endothelial dysfunction during COVID-19. "While these findings currently do not have immediate implications for treating COVID-19, targeting these immune pathways in endothelial cells may have prognostic and therapeutic benefits although further studies, including dissecting these functional changes at a single-cell level, are needed," he adds.

These findings appear online in the journal *Frontiers in Immunology.*

More information: Aging is associated with an insufficient early inflammatory response of lung endothelial cells in SARS-CoV-2 infection, *Frontiers in Immunology* (2024). DOI: 10.3389/fimmu.2024.1397990. www.frontiersin.org/journals/i … mu.2024.1397990/full

Provided by Boston University School of Medicine

Citation: New study helps explain how elderly individuals react differently to COVID-19 than young people (2024, June 10) retrieved 18 June 2024 from https://medicalxpress.com/news/2024-06-elderly-individuals-react-differently-covid.html