

Punctured lung affects one in a 100 hospitalized COVID-19 patients

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As many as one in 100 patients admitted to hospital with COVID-19 develop a pneumothorax—a 'punctured lung' - according to a study led by Cambridge researchers.

Like the inner tube of bicycle or car tyre, damage to the lungs can lead to a puncture. As air leaks out, it builds up in the cavity between the lung and chest wall, causing the lung to collapse. Known as a pneumothorax, this condition typically affects very tall young men or older patients with severe underlying lung disease.

During the pandemic, a team at the University of Cambridge and Addenbrooke's Hospital, Cambridge University NHS Foundation Trust, observed several patients with COVID-19 who had developed punctured lungs, even though they did not fall into either of these two categories.

"We started to see patients affected by a punctured lung, even among those who were not put on a ventilator," says Professor Stefan Marciniak from the Cambridge Institute of Medical Research. "To see if this was a real association, I

put a call out to respiratory colleagues across the UK via Twitter. The response was dramatic—this was clearly something that others in the field were seeing."

Professor Marciniak subsequently obtained the appropriate ethical approvals and exchanged anonymised clinic information about 71 patients from around the UK. This led to a study published today in *European Respiratory Journal*.

Although the team are unable to provide an accurate estimate of the incidence of punctured lung in COVID-19, admissions data from the 16 hospitals participating in the study revealed an incidence of 0.91%.

"Doctors need to be alert to the possibility of a punctured lung in patients with COVID-19, even in people who would not be thought to be typical at-risk patients," said Professor Marciniak, who is also a Fellow at St Catharine's College, Cambridge. "Many of the cases we reported were found incidentally—that is, their doctor had not suspected a punctured lung and the diagnosis was made by chance."

Just under two-thirds (63%) of patients with a punctured lung survived. Individuals younger than 70 years tended to survive well, but [older age](#) was associated with a poor outcome—a 71% survival rate among under 70s patients compared with 42% among [older patients](#).

Patients with a punctured lung were three times more likely to be male than female, though this may be accounted for by the fact that large studies of patients with COVID-19 suggest that men are more commonly affected by severe forms the disease. However, the survival rate did not differ between the sexes.

Patients who had abnormally acidic blood, a condition known as acidosis that can result from

poor lung function, also had poorer outcomes in COVID-19 pneumothorax.

Dr. Anthony Martinelli, a respiratory doctor at Addenbrooke's Hospital, said: "Although a punctured lung is a very serious condition, COVID-19 patients younger than 70 tend to respond very well to treatment. Older [patients](#) or those with abnormally acidic blood are at greater risk of death and may therefore need more specialist care."

The team say there may be several ways that COVID-19 leads to a punctured [lung](#). These include the formation of cysts in the lungs, which has previously been observed in X-rays and CT scans.

More information: Martinelli, A, et al. COVID-19 and Pneumothorax: A Multicentre Retrospective Case Series. *European Respiratory Journal* (2020). [DOI: 10.1183/13993003.02697-2020](https://doi.org/10.1183/13993003.02697-2020)

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