

Statins could protect older patients from severe pneumonia, study finds

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Statins could be used to treat older patients admitted to hospital with a severe type of pneumonia, researchers at the University of Birmingham have found.

A clinical trial, led by the University of Birmingham's Institute of Inflammation and Ageing, set out to determine if giving a high dose of a statin called simvastatin over a short period would improve [immune system function](#) for older adults who had been hospitalized with community acquired pneumonia with sepsis.

Pneumonia infection can happen to anyone, but older people are at greater risk of contracting both pneumonia and sepsis at the same time. Common symptoms include breathlessness, a productive cough, fever and loss of appetite. Community-acquired pneumonia with sepsis can be fatal, especially if left untreated for a long period.

Community-acquired pneumonia is one of the most common causes of avoidable hospital admission during the winter months. Figures from NHS England show that acute admissions for pneumonia have risen by 35 percent since 2013.

The trial, funded by the British Lung Foundation and the Medical Research Council and published in the *American Journal of Respiratory and Critical Care Medicine*, was also supported by the NIHR Birmingham Clinical Research Facility.

The trial involved 62 patients, aged over 55, who were admitted with community acquired pneumonia with sepsis to Queen Elizabeth Hospital Birmingham between November 2013 and January 2016. The patients were then followed up one year after treatment.

The patients were selected at random to receive either a placebo or a daily 80mg dose of simvastatin for a period of seven days as well as antibiotics and intravenous fluids used to treat pneumonia.

The researchers found that the patients who were given simvastatin had an increase in the activity of white blood cells, which help the body to

recover from pneumonia.

Lead author Dr. Liz Sapey, a Reader in Respiratory Medicine at the University of Birmingham and Honorary Respiratory Consultant Physician at Queen Elizabeth Hospital Birmingham which is part of University Hospitals Birmingham NHS Foundation Trust, explained: "When it comes to recovering from pneumonia, half of the process is down to the antibiotics used to treat the illness, while the other half of recovery is down to our own body's response from our immune system.

"We know that the immune system is compromised as we increase in age and we know from previous research in our laboratory that statins can improve how the white cells, essential for our bodies to fight infection, respond to an infective challenge.

"Our research showed that in the patients who were treated with statins rather than a placebo, their white cells function improved."

To assess if statins could also protect the body from organ failure, the researchers tracked the patient's organ function using the sequential organ failure assessment (SOFA) score. The higher the SOFA score, the more likely that the patient's health will deteriorate due to organ failure caused by sepsis. The researchers found that patients who were given simvastatin were at lower risk of organ failure.

Dr. Sapey added: "We found that both groups of patients had similar SOFA scores when they started the trial, however, all patients treated with simvastatin showed a reduction in SOFA score, whilst three patients in the [placebo group](#) showed an increase in SOFA score.

"What's more, at follow-up one year later, the results also showed that those in the placebo group had a higher rate of mortality and were re-admitted to hospital more frequently than those taking the statin tablets.

"What is interesting is that improvements to the white cell function, increasing immunity, occurred just four days into treatment with the statin.

"Our findings could be a game-changer in terms of treating older people with community acquired pneumonia with sepsis.

"The study provides further clarity on the potential role of simvastatin during infections, showing specifically its benefits to [older patients](#) with early and mild pneumonia.

"It also is evidence that a high dose for seven days is not only beneficial, but also safe."

Although these results need to be replicated on a larger scale, these findings could offer new treatment for patients who are at greater risk of combined pneumonia and sepsis infection.

Ian Jarrold, Head of Research at the British Lung Foundation, added:

"These findings are very encouraging, as they suggest that statins can boost the body's ability to fight back against infection, offering considerable protection from the worst effects of pneumonia and sepsis.

"Pneumonia places a huge burden on our health service during the winter months and reducing the risk of hospital admission must be a priority. Statins could offer a quick and effective way to help protect the most vulnerable people from death and long-term complications caused by [pneumonia](#)."

The team of researchers, led by Birmingham Acute Care Research Group based at the University of Birmingham's Institute of Inflammation and Ageing, now plan a large scale trial at multiple hospitals across the UK in order to validate the findings of their

research.

More information: Elizabeth Sapey et al. Simvastatin Improves Neutrophil Function and Clinical Outcomes in Pneumonia: a Pilot Randomised Controlled Trial, *American Journal of Respiratory and Critical Care Medicine* (2019). [DOI: 10.1164/rccm.201812-2328OC](https://doi.org/10.1164/rccm.201812-2328OC)

Provided by University of Birmingham

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