Flu and pneumonia infections increase risk of having a heart attack and stroke

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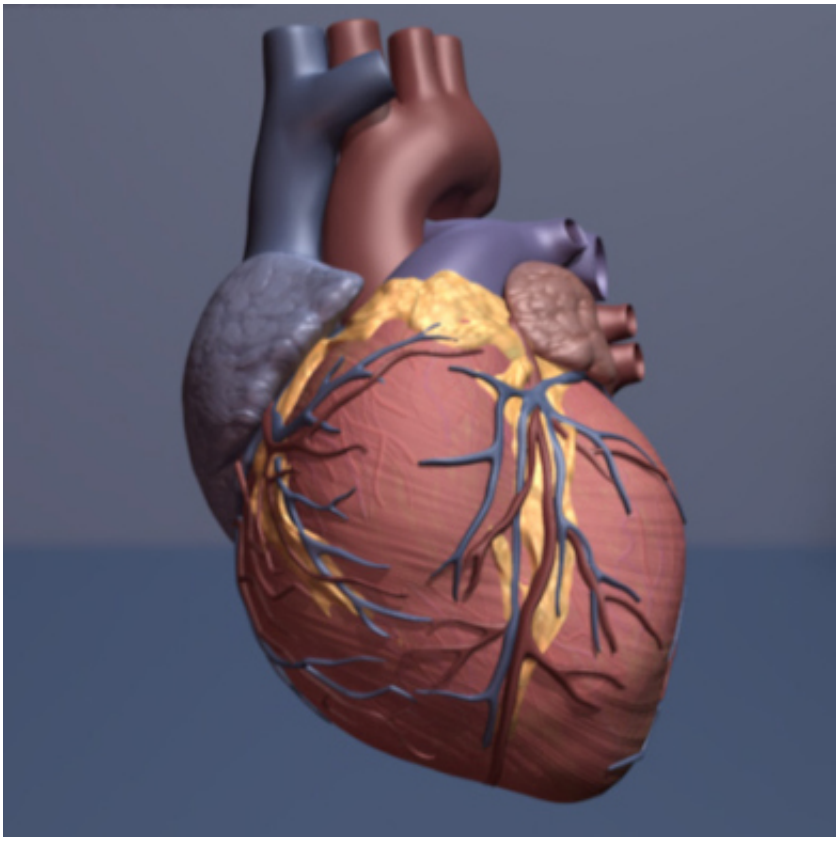

Human heart. Credit: copyright American Heart Association

People who have had flu or pneumonia may be six times more likely to suffer from a heart attack or stroke in the days after infection, according to new research published in the *European Respiratory Journal*.

The research, funded by the Academy of Medical Sciences, is the largest study to look at the risk of heart attacks and strokes due to specific respiratory infections. It found that several different organisms that cause respiratory infections also increase heart attack and stroke risk, including *S. pneumoniae* bacteria and influenza.

The researchers say that the findings suggest that getting vaccinated against these two infections could also have a role in preventing heart attack and stroke, along with preventing infection in the first place.

In general, respiratory infections are thought to increase the risk of heart attack and stroke by causing inflammation, which can lead to the development of blood clots. The influenza virus and *S.pneumoniae*, the most common pneumonia causing bacteria, can also have harmful effects on the heart muscle.

The new research found that having flu or pneumonia increases the risk of having a heart attack for up to a week after infection, and the risk of having a stroke is increased for one month.

Lead researcher Dr Charlotte Warren-Gash, Associate Professor of Epidemiology at the London School of Hygiene & Tropical Medicine, UK, explained the importance of the study: "Heart disease, strokes and lower respiratory infections have been the three leading causes of death globally for over 15 years, and are important public health problems that affect large numbers of people worldwide.

"As people age, having more than one medical condition becomes more common, so it is even more important to understand the links between different diseases. If we can understand who is at risk of these cardiovascular complications after respiratory infections, we can potentially intervene to prevent them, with methods such as vaccines."

Using national infection surveillance data from the Scottish Morbidity Record, the researchers identified 1,227 adults with a first heart attack and 762 with a first stroke who also had a respiratory virus or bacteria infection at any time between 2004 and 2014.

The research team then investigated the rate of heart attacks and strokes in the periods of time immediately after a respiratory infection, and then compared this to the rate of cardiovascular events in other periods of time in the same people.

The data showed that having a confirmed respiratory infection made people six times more likely to have a heart attack or stroke for three days after infection. Dr Warren-Gash explains: "In Scotland, among those aged 75 years and above, around two in 10,000 people have a heart attack each week. Our analysis found this figure rose to 10 in 10,000 in the week after having a respiratory infection."

The *S.pneumoniae* bacteria and the influenza virus were found to have the biggest impact on increasing the risk of having heart attacks and strokes.

The effect of infections on heart attack and stroke risk was greater in people aged less than 65 years compared to those aged 65 and above. The researchers note that vaccine uptake is higher among those aged 65 and over, and say that being vaccinated could help to protect against heart attacks and strokes after respiratory infection.

However, Dr Warren-Gash said: "For most young, healthy people, the risk of heart attacks and strokes occurring after a respiratory infection is low. This research is particularly relevant for those over the age of 65, as well as people with pre-existing heart diseases, as these groups are at higher risk of heart attacks and strokes.

"These groups are already recommended to have vaccinations against influenza and *S.pneumoniae* - the two bugs we found to be linked to the highest cardiovascular risk - but we know that vaccine uptake is not high among younger people with heart problems. Understanding that there is a link between these bugs and heart attacks and strokes is an added incentive to get those vaccinations."

The researchers acknowledge that the study was not able to look at individual effects of less common respiratory viruses, or to examine how respiratory infections affect cardiovascular risk in different age groups in detail.

Dr Warren-Gash added: "Our research highlights the importance of ongoing work into which doses of vaccine are best to protect people from heart attacks and strokes. Although flu and pneumonia seem to have the biggest impact, this research also shows that a group of other respiratory viruses had some triggering effects. We don't currently have vaccines for these viruses so further research is needed."

Professor Mina Gaga, President of the European Respiratory Society, and Medical Director and Head of the Respiratory Department of Athens Chest Hospital, said: "We already know that having a respiratory infection is associated with a temporary increase in the risk of heart attacks in the weeks that follow infection, and there is some evidence that pneumococcal and influenza vaccinations have a protective effect.

"This large study reinforces the importance of making sure patients who are at-risk of heart attacks and strokes, such as people with chronic diseases and those aged over 65, are vaccinated against influenza and pneumonia to help better protect against adverse cardiovascular complications as well as respiratory infection."

More information: Charlotte Warren-Gash et al, Laboratory-

confirmed respiratory infections as triggers for acute myocardial infarction and stroke: a self-controlled case series analysis of national linked datasets from Scotland, *European Respiratory Journal* (2018). DOI: 10.1183/13993003.01794-2017

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