
Bacterial Cause behind Fatal Heart Complications



A research team led by Professor Aras Kadioglu and Professor Cheng-Hock Toh at the University of Liverpool has shown that the cause of cardiac injury is a toxin called pneumolysin, which is released by the bacteria during infection. The researchers have discovered that this toxin could directly attack heart muscle cells, causing injury, damage and death. The research is published in the journal *PLOS Pathogens*.

Streptococcus pneumoniae is associated with increased risk of fatal heart complications including heart failure and heart attacks. However, since *streptococcus pneumoniae* is a respiratory pathogen and does not infect the heart, the association with heart problems has always puzzled clinicians and researchers.

This new research now explains why this is so. Dr Yasir Alhamdi, from the University's Institute of Infection and Global Health and lead author of the study, said: "We have discovered that the toxin pneumolysin, which is released during infection with *Streptococcus pneumoniae*, is the main reason why a significant number of patients develop rapidly progressive and fatal heart complications even if the bacteria does not directly infect the heart."

The researchers also discovered that the damage to heart muscle cells during infection with *Streptococcus pneumoniae* is further exacerbated with the use of antibiotics because antibiotic-induced bacterial death releases large amounts of pneumolysin into the blood circulation. They used liposomes to bind to and neutralise pneumolysin and prevent it from damaging heart muscle cells. They were able to show that liposomes can be used to combat deadly heart complications caused by *Streptococcus pneumoniae*. The authors suggest that liposomes could be used in conjunction with antibiotics to mitigate the pathological effects of antibiotic-induced bacterial lysis.

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Source: University of Liverpool

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