

The Unholy Alliance: Influenza and Pneumonia

At least 50 million deaths, including 10 million in India alone; that's what the 1918 Spanish Flu's frightening legacy is frequently revealed as. A number of victims indeed succumbed to the influenza virus. The rapid deterioration due to the devastating virus in previously healthy young adults was described as: 'Two hours after admission they had the Mahogany spots over the cheek bones, and a few hours later you can begin to see the cyanosis extending from their ears and spreading all over the face, until it is hard to distinguish the coloured men from the white.' But this occurred in the minority of cases. It was more a case of: If in the midst of autumn, can winter be far behind?

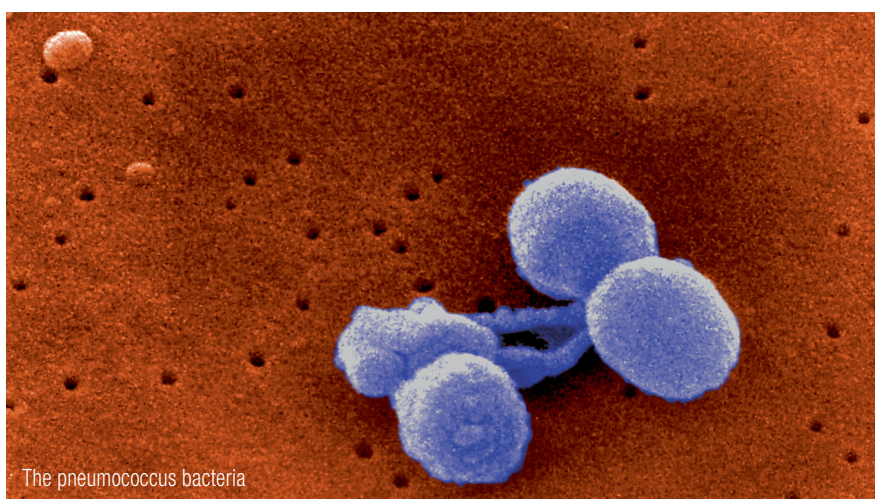
Epidemiological studies showed that the majority of cases succumbed 7-10 days after the onset of symptoms, implying a different cause as death due to the influenza virus is normally rapid. A review of autopsy studies after the epidemic revealed that the vast number of deaths, in some cases up to 90%, could be traced to a different organism. A recent re-examination of lung specimens of that era again showed consistent evidence of this, either this organism alone or superimposed on the influenza virus. We now know that in these cases the primary influenza viral infection was followed by a more lethal bacterial infection. And the commonest bacterium identified, even in Europe and first world countries, is the organism responsible for most cases of community acquired pneumonia (CAP), namely *Streptococcus pneumoniae*, also known as pneumococcus.

It is known that an influenza viral infection denudes the epithelial lining of the respiratory tract and exposes the basement membrane. Up-regulation of molecules that the pneumococcus uses as receptors then occurs, facilitating adhesion of the bacteria and subsequent invasion. The phagocytes that are supposed to attack the invading bacteria are impaired as well, and other modes of suppression of an effective immune response occur. All these factors allow the pneumococci to more easily invade and cause infection, increasing morbidity and mortality.

According to the World Health Organisation (WHO), about 1.6 million die annually due to pneumococcal infections worldwide; one of the leading causes of death on earth. In South Africa, tuberculosis has been the leading cause of death from 2009 to 2013, followed by influenza and pneumonia classified together. The disease burden due to pneumococcus is the highest in the under five age group, with a second peak with a disproportionately higher

mortality found in the elderly, especially in the more affluent countries. In the United States, about 500 000 cases of pneumonia occurs annually due to pneumococcus, with 40% requiring hospitalisation. A number of factors, such as age over 65, diabetes, smoking, chronic cardiovascular and pulmonary diseases and immunosuppression such as HIV infection increases the risk of acquiring this potentially fatal pathogen.

Prevention of respiratory infections is not commonly discussed in the travel medicine consultation, and in fact does not feature amongst the top ten topics such as diarrhoea and malaria prevention. Yet respiratory ailments are the second commonest travel related presentations after diarrhoea during travel, and, in some studies, the commonest problem post travel. Lower respiratory tract infections (LRTI) are more common in the older traveller and in one investigation nearly a quarter of febrile returning travellers had LRTI. We have to remember that about 50% of those attending a travel clinic will be over the age of fifty, a third over sixty, and 1.5%

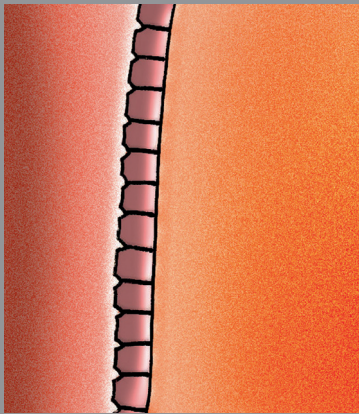


The pneumococcus bacteria

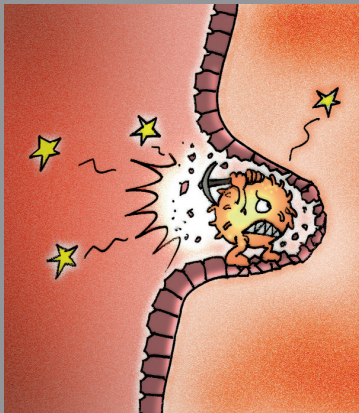


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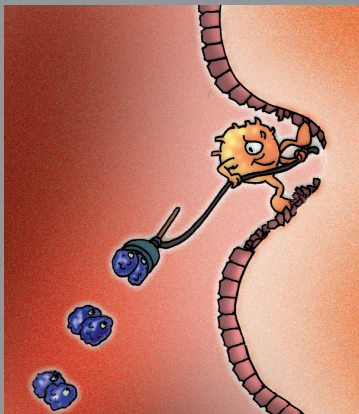




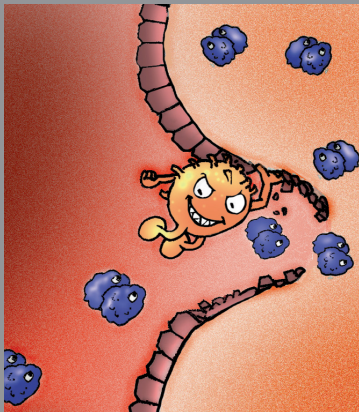
The epithelial lining of the respiratory tract is exposed to many potential pathogens



The influenza virus denudes the epithelium and exposes the damaged basement membrane to attacks by pneumococcus



Upregulation of receptors that pneumococcus uses occurs



Pneumococci have an 'easy ride' invading cells

over 80. The older person will travel and needs protection against, as described by Sir William Osler, the 'friend of the aged..... as it kills them gently without severe symptoms.' In fact he said that: 'To die of pneumonia is almost the natural end of old people.'

We of course beg to differ, as even in the winter of our despair spring cannot be far behind. A very effective conjugate vaccine has led to a significant reduction of pneumococcal disease in the paediatric population in South Africa. This vaccine is part of the routine childhood vaccination schedule and in the United States has had some protective effect on the older population due to the herd effect. In a large study in the Netherlands recently in which 85000 people over the age of 65 were followed (Community Acquired Pneumonia Immunization Trial in Adults –CAPiTA study), there was a 45% reduction in the incidence of CAP in those vaccinated compared to their non-vaccinated counterparts.

Pneumococcus has more than 90 different serotypes and the current conjugate vaccine only protects against 13 of about 30 types that cause disease. A polysaccharide vaccine which covers 23 serotypes is also available. The advantage of the conjugate vaccine is that it induces long term immunological memory, reduces herd carriage, is effective in infants, gives prolonged protection and can be boosted. A currently employed strategy as recommended by the Advisory Committee on Immunization Practices (ACIP) is to first give the conjugate one in vaccine naive adults over 65 years of age, followed 6-12 months later by the polysaccharide vaccine, with a minimum interval of at least eight weeks. Those who had the polysaccharide vaccine before should wait a year before taking the conjugate vaccine.

The double threat of influenza and resultant pneumonia should be discussed with all travellers, especially the elderly. The wily influenza H3N2 strain has drifted slightly this year, resulting in a vaccine efficacy of only 18% in the northern hemisphere. H3N2

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leads to more serious disease in the elderly, and subsequent pneumococcal invasions with its associated morbidity and mortality is a real risk. Mass Gatherings such as the Hajj have been identified as having a high incidence of both influenza and pneumonia. Vaccinating against influenza annually is now standard practice in the elderly. Vaccinating against pneumococcus, whether travelling or not, should be strongly considered to keep at bay, again according to Sir Osler, 'The Captain of the Men of Death.'

INFLUENZA

FREQUENTLY COMPLICATED WITH

PNEUMONIA

IS PREVALENT AT THIS TIME THROUGHOUT AMERICA.

THIS THEATRE IS CO-OPERATING WITH THE DEPARTMENT OF HEALTH.

YOU MUST DO THE SAME

IF YOU HAVE A COLD AND ARE COUGHING AND SNEEZING. DO NOT ENTER THIS THEATRE

GO HOME AND GO TO BED UNTIL YOU ARE WELL

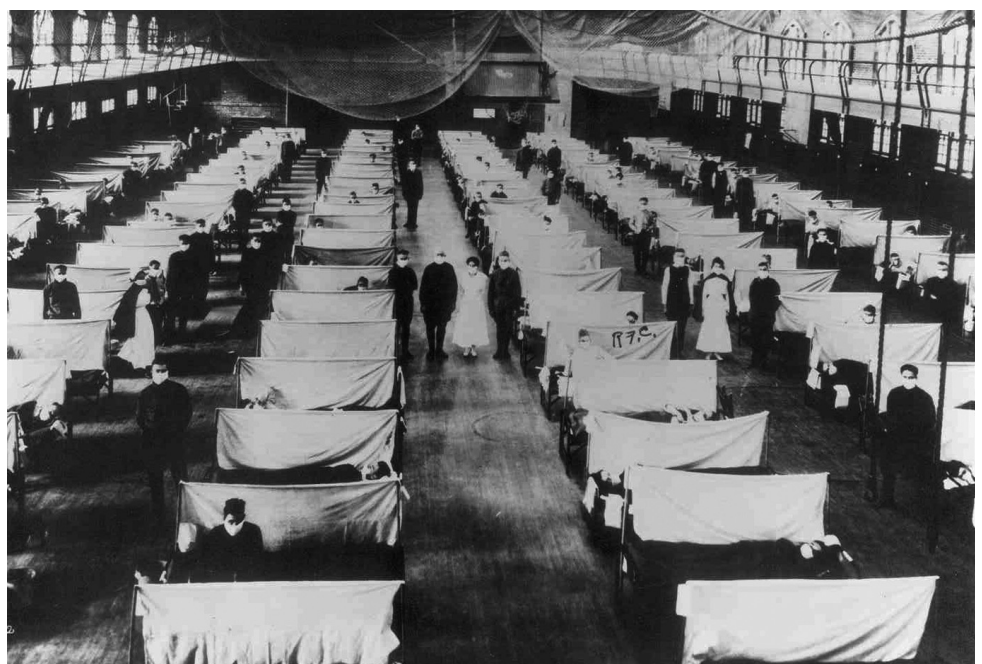
Coughing, Sneezing or Spitting Will Not Be Permitted In The Theatre. In case you must cough or Sneeze, do so in your own handkerchief, and if the Coughing or Sneezing Persists Leave The Theatre At Once.

This Theatre has agreed to cooperate with the Department Of Health in disseminating the truth about Influenza, and thus serve a great educational purpose.

HELP US TO KEEP CHICAGO THE HEALTHIEST CITY IN THE WORLD

JOHN DILL ROBERTSON
COMMISSIONER OF HEALTH

Public campaigns acknowledge the link between influenza and pneumonia



The 1918 Spanish Flu led to the death of more than 50 million. Pneumococcus is thought to have the cause in the majority of cases