

Robert Koch



Tuberculosis
the ancient killer!

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Plan

In this project there was information I wanted to find out about tuberculosis as I have been vaccinated at school. I wanted to know more about it. One of the first questions I asked myself was what is tuberculosis and where did it originate?. During this investigation I found tuberculosis one of the first infections. It was in the spines of mummies and dates back to 4000 BC.

I wanted to find out if there was only one stage of infection or if there were many stages. I also wanted to know how it was transferred from human to human and if it could be passed of from animal to human. We all know it is transferred though the air but I wanted to know if a person could get infected instantly or if you have to be in contact with an infected person for a long time.

I had to select statistics for the investigation so I chose Scotland and Ireland to see if these near by countries had any differences in statistics I found out that there was not much difference between the two countries, as I expected.

The last thing was I already know that tuberculosis could be prevented but I also wanted to know if tuberculosis could be cured with the right medication. I also wanted to fine out what the optimum living conditions were for this bacterial infection.

Introduction



Fig 1 Robert Koch

Robert Koch is a world famous scientist. He has researched tuberculosis anthrax in cattle, cholera where he studied in India, black water fever and malaria. Robert Koch and Louie Pasteur are the two founders of modern bacteriology.

In 1905 Robert Koch was awarded the noble prize for medicine for his work on tuberculosis that work was followed up by other researchers to produce the heaf test and the BCG.

What is tuberculosis?

On 24th of March 1882, Robert Koch first discovered that it was bacterium (or more precise mycobacterium tuberculosis) that caused tuberculosis. First Koch believed that milk was a source of infection but that was not the case because Louis Pasteur discovered a way to destroy the bacteria using pasteurization but the number of infections still increased. Koch then found out that the TB was transmitted through the air and that the two types of bacterium (human and cattle) were not linked at all with one other. Now scientists have found that close contact is needed with a person who is infected.

TB was found to date back to 4000 BC where it was found in the spines of Egyptian mummies. Later were infections of Tb in India and then America. No one knew that it was a disease until the 1820s even then it was not name tuberculosis until 1839 AD.



Fig 2: view of tuberculosis under microscope

This is how TB looks like under the microscope. The red rods are the bacteria that causes TB. As known before, TB most commonly affects the lungs. When TB has affected the lungs this is where it becomes contagious. TB can affect any other internal organ in the body like the large intestine or kidney but can not cause infection to any other person. there are two different stages of TB, one is infection and the other is disease.

At this point in the investigation I found Robert Koch was one of the best scientists in the world because even though he did not develop all the medicines that exist clearly his research was a major contribution to the medicines of today and his investigation with TB alone has made a big leap forward in medicine.

TB infection VS TB disease

TB Infection	TB disease in lungs
M.TB. Present	M.TB. Present
Tuberculin skin test positive	Tuberculin skin test positive
Chest X-ray normal	Chest X-ray usually reveals lesion
Sputum smears and cultures negative	Sputum smears and cultures positive
No symptoms	Symptoms such as cough, fever, weight loss
Not infectious	Often infectious before treatment
Not defined as a case of TB	Defined as a case of TB

The tuberculin skin test is a test that shows if a person has ever been in contact with TB. The test contains TB proteins (antigens). The jab is made under the skin of the forearm and the test will show a positive reaction within two days if that person has been in contact with TB. People that this test is benefit to is for example healthcare workers, people and abnormal chest x-rays and HIV positive.

In 1987 there was no known cure for TB but now because of advanced medicine, this is no longer the case. there are special antibiotics that can cure TB and stop the bacteria for being infectious within two weeks but the treatment must continue for a further 6 mouths to a year to completely clear the infection.

Scotland and Ireland statistics

In Scotland in 1987 there were 5,745 cases of TB in Scotland but in 1991 tuberculosis had decreased dramatically to 700 cases. Now in 2007 there is only one case of TB with in ten thousand people in this entire country. The tables below show the figures, table one is stistics for Scotland and stistics for Ireland.

Table 1

Year	Number
1991	700
1992	556
1993	508
1994	487
1995	465
1996	450
1997	397
1998	350

Table 2

Year	Number	Crude rate per 100 000	Three year moving average
1991	640	18.2	
1992	604	17.1	621
1993	598	16.9	581
1994	524	14.5	526
1995	458	12.6	468
1996	434	12.0	438
1997	416	11.5	426
1998	424	11.7	

These tables show between Scotland and Ireland there is not much difference because the two countries are just across from one another If we took countries like Asia, Africa and eastern Europe that have a high ratio of TB cases per year, this is because they have poor living conditions and over crowed living conditions.

Ways to detect and cure tuberculosis TB

The Mantoux test has many names e.g. Mantox screening test or the Pirquet test this is a diagnostic tool in medicine for tuberculosis. This test is being used in the United States but the Heaf test was used in the United Kingdom till 2005 as the test has been stopped being used because of the diplomatic medical, arguments over the 8 needle puncture wound. The UK uses the Mantoux test along with America.

The Mantoux test is made up of a glycerin extract that comes from the tubercule bacilli. This is a purified protein that is obtained from filtrates of sterilized, concentrated cultures. Robert Koch first described this in 1891. The test is named after a scientist called Charles Mantoux who developed the work of Koch and Clemens von Pirquet to create his test in 1907.

The procedure of this test is 0.1 ml solution of the bacterium is used in something that leaves a one-prick needle mark on the forearm. The reaction is read using the diameter of induration, which is the palpable raised hard area along the forearm. The test should not be read with the redness of the skin.

The Heaf test is a skin test that is performed to find out if a person already has the ability to make antibodies for TB. The Heaf test is also performed on the forearm with tuberculin. This test leaves 8 circular needle marks on the forearm. This causes the area to become red and raised to indicate that there is immunity already. If there is no redness a BCG vaccine was given to that person because there was no immunity. This was widely used in the UK till 2005 when the vaccine was stopped being used in most high schools. Now it is only used in schools if the city infection rate is 40% or more but the BCG is not world widely known. There is still a chance that people with the vaccine can still get infected from the bacterium.

The first success in the immunization of Tb was developed in 1906 (the BCG). This came about using the Bacterium of Calmette. The BCG was first tested in France on 18 of July 1921 although there was no wide spread use in, the USA, Great Britain or Germany till after World War 2. The numbers of deaths caused by TB rapidly fell from the UK. The present day even if a person has TB there are drugs now to combat the infection.

There are specific antibiotics that have been recently invented to combat tuberculosis.

Conclusion

I think Robert Koch is better than Darwin, because Robert Koch's research has made a big contribution to society. Even if he never finished the vaccine his research was a major contribution to the vaccine that exists today. This means that Robert Koch is responsible for the decreasing number of cases of tuberculosis throughout the years. There is only one problem with the society now. There is not enough money to give everyone the vaccine that would stop the spread of the disease and wipe it out completely in the UK. Also immigrants should be screened before entering the country to stop more cases of TB entering the UK, as this is a major contributor to the number of cases in Britain especially in London. Blame has also to be put on the general public as alcohol abuse and HIV also contributes to the number of cases. Now that the government has stopped the BCG, could we be asking for another outbreak for future generations

Evaluation

Have completed through this project there was certain things I would change to make sure that the assignment is much better than what it is the now.

One of the first things I would have done is I would have found much more ways of getting my material instead of relying on the internet. One of the other things I should have done is given myself much more time to write up this assignment as I felt like I had left it to last minute. I would be much happier if I gave myself much more time to rewrite the project.

Thought out this whole project I have learned how to structure a project how to research for the assignment and how the finished article should look like. This is a assignment that I am proud of overall.

Biography

Information I used

http://nobelprize.org/nobel_prizes/medicine/laureates/1905/koch-bio.html

<http://www.netdoctor.co.uk/diseases/facts/tuberculosis.htm>

Pages from www.google.com and www.ask.com

All pictures from

<http://www.google.co.uk/>

Statistics

Search engines used

www.ask.com

www.google.com