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Introduction

Legionnaires' disease is a potentially fatal lung infection (pneumonia) that is caused by the bacteria legionella.

The condition is called Legionnaires' disease because it was first identified after a mass outbreak at a hotel hosting a convention of a veteran organisation known as the American Legion.

Legionella

Legionella bacteria is commonly found (often in low numbers) in sources of water, such as rivers and lakes.

The bacteria sometimes find their way into artificial water supply systems, such as air conditioning systems, hot and cold water services, and cooling towers. Given the right conditions, legionella bacteria can rapidly spread, contaminating these water systems.

Legionnaires' disease is not contagious

Legionnaires' disease is contracted by breathing in small droplets of contaminated water. However, the condition is not contagious and cannot be spread directly from person to person.

Large buildings such as hotels, hospitals, museums and office blocks, are more vulnerable to legionella contamination because they have larger, more complex water supply systems, in which legionella contamination can quickly spread.

There are strict regulations regarding the maintenance and control of water supply systems, such as either keeping the water cooled below 20C (68F), or heated above 60C (140F), in order to prevent an outbreak of Legionnaires' disease.

How common is Legionnaires' disease?

During 2006, there were 551 reported cases of Legionnaires' disease in England and Wales. It is thought that 160 of these cases occurred while the affected person was travelling abroad.

The actual number of cases of Legionnaires' disease may be much higher than the reported number of cases. This may be due to people with mild symptoms of the condition being misdiagnosed with more common forms of pneumonia and so these cases may not be reported to the health authorities.

Prognosis

In particularly vulnerable people, such as the elderly, or people with a pre-existing health condition, Legionnaire's disease can be very serious.

An estimated 10% of people who contract Legionnaires' disease will die from complications arising from infection. In 2006, there were 52 deaths from Legionnaires' disease in England

and Wales.

Prompt treatment using antibiotics is essential in treating Legionnaires' disease and reducing the risk of death.

Symptoms

The symptoms of Legionnaires' disease can begin anytime from between 2-10 days after exposure to the initial infection. However, 3-6 days is the most common incubation period.

Symptoms usually begin with an initial phase lasting 1-2 days, in which you experience:

- mild headaches, and
- muscle pain.

This is followed by the onset of more severe symptoms including:

- high fever, usually a temperature of 40C (104F), or above,
- more severe muscle pain, and
- chills.

Once the bacteria begin to infect your lungs, you may also experience:

- a persistent cough, which is usually dry at first but as the infection develops you may start coughing up mucus or possibly blood,
- shortness of breath, and
- chest pains.

About 30% of people with Legionnaires' disease will also experience gastrointestinal symptoms including:

- nausea,
- vomiting,
- diarrhoea, and
- loss of appetite.

About half of those with Legionnaires' disease will also experience changes to their mental state, such as confusion.

When to seek medical advice?

The symptoms of a high fever are almost always due to infection. While it is unlikely to be the result of Legionnaire's disease, if you have a high fever you should contact your GP as soon as possible. Alternatively, you can telephone NHS Direct on 0845 46 47 for advice.

Causes

Legionella bacteria can be found in any freshwater environment, such as rivers and lakes. The bacteria are usually only present in the low numbers because the temperature of the water is often too cold for the bacteria to grow and spread.

However, if the bacteria manage to find their way into an artificial water system, given the right circumstances, they can quickly grow and reproduce, leading to a wide spread contamination of the water system.

The two things the bacteria require to grow and reproduce are:

- a water temperature of between 20-45C (68-113F), and
- impurities in the water that the bacteria can use for food, such as rust, sludge, algae, and limescale.

Water systems known to be vulnerable to legionella infection include:

- hot and cold water systems for large buildings, such as hotels and hospitals,
- air conditioning systems that use water for cooling purposes, and
- cooling towers.

However, any artificial water system is potentially vulnerable to infection. Cases of Legionnaires' disease have been reported as arising from contaminated:

- baths and showers,
- fountains,
- sprinkler systems,
- whirlpool baths,
- spas, and
- humidifiers that were being used in food display cabinets.

Legionnaires' disease can be contracted by inhaling contaminated water - for example, by directly drinking the water, or by inhaling small droplets of water mist that are present in the air.

Risk factors

Everyone is potentially vulnerable to Legionnaires' disease, but there are a number of risk factors that make it more likely that certain individuals will experience a more severe form of the infection. These risk factors include:

- being 50 years of age, or over,
- being a smoker, or having a past history of heavy smoking,
- having diabetes,
- having kidney disease, and
- having cancer, particularly lung cancer, or leukemia.

Having a pre-existing lung condition, such as chronic obstructive pulmonary disease (COPD) is also a risk factor for Legionnaire's disease. See the 'useful links' section for more information about COPD.

Diagnosis

You should visit your GP if you are concerned that your symptoms may be the result of Legionnaires' disease.

Inform your GP if you have recently spent time in a building, such as a hotel, or hospital, that could be vulnerable to a legionella infection. You should also let them know if you have recently travelled abroad because an estimated 30% of cases of Legionnaires' disease are

contracted abroad.

This information will be helpful in confirming a diagnosis and possibly allowing the health authorities to pinpoint the source of the infection.

Legionnaires' disease can be diagnosed using a urine test. If the bacteria are present in your body, your immune system will produce special proteins, known as antigens, in an attempt to fight off the infection. These antigens will be detectable in your urine.

Further tests may be recommended in order to assess the affect that the infection is having on your general state of health, and on organs, such as your lungs and kidneys.

These tests include:

- blood tests, and
- a chest X-ray.

A lumbar puncture may also be carried out. It involves taking a small sample of cerebrospinal fluid (CSF) from the base of your spine. CSF is a clear fluid that surrounds and supports the brain. It will be checked to see if the bacteria has infected the brain.

Treatment

Legionnaires' disease is treated using an injection of antibiotics (intravenous antibiotics). A 10-14 day course of antibiotics is usually required.

Possible side effects of the antibiotics that are used to treat Legionnaires' disease include:

- dizziness,
- nausea,
- headaches,
- chest pain, and
- loss of appetite.

If you have pre-existing risk factors that make you more vulnerable to the effects of Legionnaires' disease, such as being elderly, or having diabetes, it is likely that you will be admitted to hospital, so that the functions of your body can be supported while your body recovers from the infection.

You may be given an oxygen mask so that the functions of your lungs can be supported, and intravenous fluids in order to prevent you becoming dehydrated.

Complications

In particularly severe cases of Legionnaires' disease, a number of life threatening complications can occur. These include:

- **respiratory failure** - where the lungs are unable to provide the body with enough oxygen,
- **kidney failure** - if the kidneys stop working it can lead to a dangerous build-up of fluids and waste in the blood, and
- **septic shock** - where a blood infection leads to a sudden and dangerous drop in blood pressure.

In England and Wales, an estimated 10% of people who contract Legionnaires' disease will die due to serious complications.

Prevention

The best way to prevent an outbreak of Legionnaires' disease is to ensure that any water system under your control is properly maintained and conforms to the relevant Health and Safety regulations.

The two most important factors to prevent an outbreak of Legionnaire's disease are :

- **temperature** - any water in the system should either be cooled to below 20C (68F), or heated to above 60C (140F), and
- **hygiene** - the water should be kept free of any impurities and never allowed to stagnate.

If you are an employer, or a private landlord, you have a legal duty to ensure that all water systems in your premises are properly operated and maintained in order to prevent Legionnaire's disease, or any other type of water-borne infection.

See the 'useful links' section for more information about the Health and Safety Executive (HSE) guidance relating to Legionnaire's disease.

References

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