Farmer’s Lung – Fact Sheet



WHAT IS FARMER’S LUNG?

Farmer’s Lung is an allergic disease usually caused by breathing in the dust from moldy hay. However, dust from any moldy crop – straw, corn, silage, grain, or even tobacco – can also cause Farmer’s Lung.

The technical name for Farmer’s Lung is “extrinsic allergic alveolitis”, “hypersensitivity alveolitis” or more generally “hypersensitivity pneumonitis”. The “-itis” word ending means inflammation, so “alveolitis” means inflammation of the alveoli. “Pneumonitis” means inflammation of the lungs (“pneumon”, Greek for lung). There is a diagram of parts of the lung and respiratory system in the document How Do Particulates Enter the Respiratory System?.

As the name suggests, Farmer’s Lung is caused by inhaling certain allergy-causing dust found in some agricultural operations. A recent study shows that exposure to organochlorines and carbamate pesticides may also be risk factors for farmer’s lung. However, “extrinsic allergic alveolitis” or “hypersensitivity pneumonitis” are general medical terms that include other lung conditions resulting from exposure to allergy-causing dusts found in different kinds of workplaces or locations. Examples of related lung conditions are available in the extrinsic allergic alveolitis document.

WHAT CAUSES FARMER’S LUNG?

People can get Farmer’s Lung by breathing in dust containing the spores of special, heat-tolerating bacteria or moulds often found on moldy crops. Spores from two types of bacteria, “Micropolyspora faeni” and “Thermoactinomyces vulgaris”, and certain types of moulds called “Aspergillus” are the major causes of Farmer’s Lung.

In areas where crops are harvested in wet or rainy weather, crops usually undergo self-heating while in storage. When this happens, heat-tolerating bacteria and moulds grow rapidly and cause spoilage. As spoiled hay dries, it darkens, crumbles easily, and is extremely dusty. This dust that contains bacteria and mould spores is extremely fine. People can breathe these spores into the innermost regions of the lungs (alveoli) where the problem begins.

The spores that cause Farmer’s Lung are not infectious. Instead, they trigger an

allergic reaction. Allergic reactions are produced by the immune system, the body's defence system that normally protects against infectious diseases. The immune system reacts when special substances called "antigens" enter the body. Antigens are usually found on germs such as infectious bacteria or viruses. The immune system reacts to neutralize these germs and prevent infections. Antigens are also found on harmless material such as mould spores. Sometimes the immune system will react against these by producing a harmful reaction (e.g., an allergic reaction) against an antigen attached to material like a spore that is otherwise harmless.

Farmer's Lung develops in two steps, as other allergic reactions do. The first time a person inhales a large amount of dust and spores from moldy hay, the immune system often responds by producing specific antibodies against the antigens. Antibodies are chemicals that circulate in the blood and attack specific antigens. Once the body has produced these antibodies, there is a chance that further exposure to moldy dust can generate a hypersensitive type of allergic reaction. This reaction is typical of Farmer's Lung.

A hypersensitive reaction is triggered when antigens in the lungs react with antibodies that circulate in the blood; this sets off a complicated reaction normally intended to protect the lungs from infections. Certain types of white blood cells move into the lungs to attack the antigens. Then, other types of white blood cells move into the lungs, releasing chemicals and poisons that increase blood flow and kill lung tissue close to the antigens. This response causes swelling, inflammation and damage to lung tissue, resulting in noticeable breathing problems.

HOW COMMON IS FARMER'S LUNG?

There is little information on the exact number of people with Farmer's Lung in Canada. Studies show that incidence varies from place to place. The disease seems to occur in about 2 to 10 percent of farm workers, depending on the region. In some areas, blood tests have shown that 20 to 40 percent of farm workers have antibodies that react with antigens responsible for Farmer's Lung. This test indicates that people have had at least an initial exposure to moldy dust.

The disease is most common in regions with wet weather at harvest time. Farmer's Lung is also more common on dairy farms, especially those not equipped with automated equipment for handling hay or feed. Incidents of Farmer's Lung occur most often in late winter or early spring when stored hay or grain is used to feed livestock.

WHO IS AT RISK OF DEVELOPING FARMER'S LUNG?

Farmer's Lung is a risk for adults who breathe dust from moldy hay or other moldy crops. Children rarely develop Farmer's Lung.

The degree of risk depends on the amount of dust that has collected in the person's lungs. There is little danger working with loose hay in an open field. However, the risk increases when farmers or farm workers are breaking open bales of moldy hay or straw inside closed barns or sheds. A person can inhale an extremely large amount of dust within a very short time while working indoors.

Other people exposed to dust from moldy hay, straw or grain include grain

handlers, stable employees, poultry workers, attendants of zoo and circus animals and pet shop workers. Studies also show that Farmer's Lung is a risk for city dwellers who visit stables, even occasionally.

HOW CAN YOU TELL IF YOU HAVE FARMER'S LUNG?

The signs and symptoms of Farmer's Lung vary tremendously. The allergic response of the afflicted person depends on the sensitivity of the individual and the amount of moldy dust entering the lungs. The reaction can be a sudden attack or symptoms associated with a slow progressive illness.

Usually, people with Farmer's Lung do not associate their health problem with exposure to moldy hay. Instead, they go to their doctors complaining of breathing problems. It is important to recognize the danger of working with moldy crops and to be able to recognize the signs and symptoms of Farmer's Lung. This awareness enables people with symptoms to get medical help before it becomes a serious illness.

There are three different types of allergic responses: acute or intense attack, sub-acute or low-level response, and chronic or long-term response.

Acute Farmer's Lung

Acute Farmer's Lung is easy to notice and occurs in about one in three cases. It starts as an intense attack about 4 to 8 hours after the person breathes in a large amount of dust from moldy crops. These are some of the signs and symptoms:

- shortness of breath,
- a dry irritating cough,
- a sudden general feeling of sickness,
- fever and chills,
- a rapid heart rate, and
- rapid breathing.

If the person avoids further exposure to moldy dust, the signs and symptoms usually decrease after 12 hours, but they can last up to two weeks. Serious attacks can last as long as 12 weeks. The symptoms are sometimes confused with pneumonia.

Sub-Acute Farmer's Lung

Sub-acute Farmer's Lung is more common than acute Farmer's Lung but it is less intense and more difficult to notice. It develops slowly, responding to continual exposure to small amounts of moldy dust. The signs and symptoms include:

- coughing,
- shortness of breath,
- a mild fever and occasional chills,
- a general feeling of sickness,
- aches and pains in the muscles and joints, and
- a loss of appetite and loss of weight.

People who are sensitive to dust from moldy crops continue to exhibit these signs and symptoms as long as they are exposed to the dust. This condition

sometimes resembles a “chest cold” that lingers throughout the winter. Some people lose weight over several weeks.

Chronic Farmer’s Lung

Chronic Farmer’s Lung develops after several acute attacks over a period of years. It afflicts people who have been continually exposed to large amounts of moldy dust. Sometimes, the illness lasts several months and is marked by increasing shortness of breath, an occasional mild fever, and often, a significant loss in weight and a general lack of energy. The symptoms are accompanied by permanent lung damage and gradually worsen as exposure to moldy dust continues.

WHAT TESTS ARE AVAILABLE FOR FARMER’S LUNG?

There is no single, simple test to distinguish between Farmer’s Lung and other types of lung diseases. The most important evidence for Farmer’s Lung is the history of exposure to dust from moldy hay or other moldy crops and the development of signs and symptoms 4 to 8 hours later. This awareness is why it is so important for a doctor to know if a patient with shortness of breath has been exposed to moldy crops.

A physician may request a number of tests including:

- a lung x-ray,
- a blood test for antibodies,
- a pulmonary lavage test to examine the contents in a small area of the lungs,
- lung function tests to examine air flowing into the lungs and gas exchange from the lungs to the blood,
- a lung allergy challenge test to identify the specific cause of the allergic reaction, and
- a lung biopsy to examine lung tissue in more serious cases.

WHAT IS THE TREATMENT FOR FARMER’S LUNG?

For people suffering from acute attacks of Farmer’s Lung, the first step in treatment is to avoid further contact with moldy dust. For serious cases, bed rest is recommended and oxygen therapy may be needed to relieve shortness of breath.

Certain medications provide relief from an allergic response during acute attacks and make breathing easier. The long-term use of these drugs is not advisable since they can hide the symptoms of Farmer’s Lung without preventing lung damage from re-exposure to moldy dust.

No cure exists for people who become hypersensitive to moldy dust. Once people become hypersensitive, they remain hypersensitive for years, perhaps for life.

HOW CAN WE PREVENT FARMER’S LUNG?

There is no simple method to prevent conditions that lead to Farmer’s Lung. Steps must be taken to avoid crop spoilage and production of bacterial or mould spores that cause the allergic reaction. Workers must also take precautions to avoid breathing in spores from moldy crops. The following measures are

recommended:

- Wet hay, grain, or other crops can be dried at harvest. This is often an effective solution but it is seldom easy and usually expensive.
- If possible, hay with a high risk of spoilage should be stored in silage instead of bales.
- Buildings with large amounts of dusty material should be properly ventilated.
- Farm chores that involve handling hay or feed should be mechanized as much as possible to reduce exposure to moldy dust.
- During cleaning of barns or stables, dust from moldy crops should be wetted down before being swept to prevent it from becoming airborne.

Approved, properly fitted respirators designed to protect against moulds, bacteria, and dusts may protect the lungs from spores of moulds or bacteria.

This equipment, however, is seldom viewed as an easy solution. Professional advice is required for selection of the proper mask and filter.

Individuals must also receive training on the proper use of the equipment and procedures for maintenance and repair. To be effective, the respirator should be worn on every occasion that farm dust is encountered.

In all cases, however, a key protective measure is to investigate any procedure that can reduce or completely prevent the growth of the heat-tolerant bacteria or moulds that create the unwanted dust.

HOW CAN WE COPE WITH FARMER’S LUNG?

No simple solution exists for coping with Farmer’s Lung once a person has the disease. In general, hypersensitive people must avoid breathing dust from moldy crops.

Where the problem remains unsolved for long periods, hypersensitive people may actually have to consider leaving the dusty environment and changing their occupation to avoid slow, progressive, permanent lung damage.,

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