**Jaishree Charan**

**Lung disease and treatments**

**You are to choose one lung disease from List A and one disease from List B to research and find information about the named aspects of each disease. You will then complete an in-class validation assessment on your research without notes.**

**DISEASES**

|  |  |
| --- | --- |
| **LIST A** | **LIST B** |
| **Chronic bronchitis** | **Pneumonia** |
| **Emphysema** | **Pleurisy** |
| **Cystic fibrosis** | **Tuberculosis** |

**Check list**

* **Cause, or main causes**
* **Symptoms and diagnosis**
* **Current treatments…how they work and what they do**
* **Prevention**

**Write the names of the diseases you have chosen here:**

**Disease A- cystic fibrosis**

**Disease B** - Pleurisy

**Marks Table**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Report** | **Cause** | **Symptoms** | **Treatments** | **Prevention** | **Marks** | **Your mark** |
| **Disease A** | **1** | **1** | **1** | **1** | **5** |  |
| **Disease B** | **1** | **1** | **1** | **1** | **5** |  |

**Lung disease and treatments**

The respiratory system is a network of organs and structures that assists in gas exchange. The main job of the respiratory system is to move fresh air into your body while removing waste gases (“How Lungs Work | American Lung Association”). (“Does oxygen or carbon dioxide control breathing? | Blog”) All cells require oxygen for cellular respiration as cells use aerobic cellular respiration, glucose reacts with oxygen, to form ATP energy. For cells to remain productive healthy there needs to be a constant gas exchange. A lung disease is disorders affecting the lungs, such as asthma, COPD, infections like influenza, pneumonia and tuberculosis, lung cancer, and other breathing problems. These can reduce the amount of gas exchange that happens in a certain time causing cellular respiration to occur slower. Some lung diseases can lead to respiratory failure and entire organ failure while some might simply just cause difficulties in everyday life. These diseases are caused by many varied reasons, these could include, unsanitary conditions, viruses, unhealthy lifestyle or simply just genetics and non-contagious. Genetics play a vital role in a person’s lifestyle. Sometimes genetics may cause iron deficiencies, or vitamin d deficiency due to the lifestyle of the birth parents. These symptoms can be reduced using medicines and regular supplement to fulfill the needs to the body. however, some Mutations in genes can cause chronic diseases in offspring causing long term problems and reducing their chance to live life normally. This report will be explaining two of the following lung diseases caused by genetic mutations:

* Cystic fibrosis
* Pleurisy

This following report will also include the symptoms, causes and current treatments of the diseases above.

**Cystic Fibrosis**

**Cause, or main causes**

Cystic fibrosis is a genetic disease that causes mucus to build up in organs such as the lungs and pancreases. Due to the fact the cystic fibrosis in purely genetic, it is not contagious. It must be inherited instead by faulty cystic fibrosis gene from both parents ( the parents must be carriers of the genes). healthy Lungs are lined by mucus that is thin, slippery, and watery trapping irritants in airway and moving along with the air. In contrast to this, lung affected by cystic fibrosis contain thicker mucus that clogs the airways ad keeps the irritants and bacteria caught in the lungs. The build-up of thick mucus in lungs is caused by gene called Cystic Fibrosis Transmembrane Regulator (CFTR). This is a gene that controls the flow of salt and water in and out of the body. CFTR gene provides instructions to produce channels called, cystic fibrosis transmembrane conductance regulator. This acts as a chloride channel across the membrane, which helps balance of salt and water in and out of the cell. Cystic fibrosis cause mutations in the CFTR gene making the flow abnormal

Normally When sweat is produced sodium, chloride and water is extruded in the glands. Before the sweat and go out of the skin the large amounts of sodium, chloride and some amounts of water is reabsorbed back in by the CFTR complex, to create a hypotonic solution than can then leave through the skin surface. However, in cystic fibrosis the CFTR complex does not function properly. This results in the chloride, salt and water not being absorbed back in before leaving the body. This causes the sweat to leave the surface of the skin as a hypertonic solution rather than a hypotonic solution with high concentrations of water sodium and chloride. water in airways thins out the mucus. However, when patients with CF sweat ,there is an excessive loss of salt and water. the absence of salt and water allows the mucus to grow thicker and clog the airways with bacteria. This is a reason that patients with CF are often more likely to contract lung diseases.

**Symptoms and diagnosis**

* A persistent cough that produces thick mucus (sputum)
* Wheezing
* Exercise intolerance
* Repeated lung infections
* Inflamed nasal passages or a stuffy nose
* Recurrent sinusitis
* Salty sweat

Diagnosis of cystic fibrosis is often made through a sweat test. A sweat test, measures the quantity of salt and chloride leaving the body in a healthy person the normal sweat chloride concentration would be about, twenty-nine mmol/L or less (Farrell 2017).however, the concentration result of a cystic fibrosis patient (regardless of age) would be between 30 - 59 mmol/L. If this concentration of >60 mmol/l is found in a patient, further diagnosis is advised through a genetic test. Since CF is genetic the patient will need to have two copies of the mutation from both parents. Genetic testing for CF is usually performed using blood sample but may also be done by taking a swab of cells from the skin. (“How Cystic Fibrosis Is Diagnosed - Very well Health”) The DNA is collected and compared to both birth parents. If the mutation is spotted in the parents, then it is positive that the child has cystic fibrosis, however if only one parent contains the mutation, then the child will not be patient of cystic fibrosis but would be a carrier of the mutation. There are over 23,000 mutations of CF, which is why there is no one test fits all, and there are many more test that can be done to detect the certain type of mutation a patient may contain.

**current treatments**

Since cystic fibrosis is a genetic mutation there is no cure. However, there are ways to reduce symptoms. There are many alternatives that can help a patient breathe better. These include nasal and sinus surgery, oxygen therapy, physiotherapy and more. Physiotherapy is a type of airway clearance technique that helps loosen and remove the mucus from the lungs. A patient of CF often takes around 30-40 tablets a day. These include antibiotics, enzyme supplements, multivitamins and many more. Two patients with CF must never be in contact with other patients (they must be a minimum of six feet apart), as they carry bacteria within their lungs that are harmful to each Other. High fat and alt food is also advised to patients to make up for the salt loss. Following the precautions needed for cystic fibrosis can increase the life expectancy of CF patients and increase living standards.

**Pleurisy**

Pleurisy is the inflammation of the membrane that surrounds the lungs and chest cavity. (“Pleurisy Market Size, Share and Industry Analysis ...”) The pleura is a long and thin tissue that separate the lungs from the chest wall. (“Jason Aldean's Wife Brittany Heads to ER After ...”) The pleura Is a thin membrane that folds into itself to forma a bilayer membrane structure. The pleura includes two thin layers that protect the lungs. The two layers are :

* The visceral pleura (inner layer). The layer that wraps around the lungs tightly. This layer is sticks tightly to the lungs to avoid being peeled off. The layer also covers adjoining structures of the lungs that are joined vis blood vessels, bronchi, and nerves.
* The parietal pleura (outer layer). This layer attaches itself to the chest wall.

"The space between the two pleurae is called the pleural cavity." (“West Ada School District”) This space contains tiny amounts of plural fluid (acts as a lubricant). The fluid allows the lung , which is covered in visceral pleura, to slide freely over the parietal pleura while preventing friction. In pleurisy the infection affects the lining layers which then get inflamed and irritated. the inflammation of the pleura leads to a loss of smooth sliding movement between the two layers. Due to this the two layers rub against each other causing sharp pain in the chest. When breathing occurs the lungs expand outwards. Which causes the two inflamed layers to create friction that is painful. Pan also occurs when coughing. Sometimes the inflammation can cause a build-up of the fluid between the two membranes which surrounds the lungs causing compression and leading to breathing difficulties , this known as pleural effusion.

In most cases pleurisy is caused by a viral infection such as flu or a bacterial infection, such as pneumonia. This disease can also be caused by trauma to the chest wall, blood clots and cancer. These can cause the infection to be spread to the bilayer causing inflammation.

**Symptoms and diagnosis**

Symptoms of pleurisy may include:

* pain in the chest, which may be:
* sharp or stabbing in nature
* aggravated by taking a deep breath in, coughing, or moving around
* felt in the muscles of the chest
* persistent cough
* breathing difficulties
* generally feeling unwell
* fever.

The risks of contracting pleurisy are increases if there has been a recent infection in the respiratory tract.

The diagnosis of pleurisy involves several tests for example:

Physical examination- the doctor uses a stethoscope to check the breathing and listen if the pleura rubbing against each other. Sound abnormalities, such as rattling or crackling may also indicate pleurisy.

Blood test – determine if the cause ins viral or bacterial

Bronchoscopy- a thin tube with a camera is inserted in the patient’s windpipe to examine the airway for inflammation or excessive fluids

**current treatments and prevention**

doctors believe that treating the underlying cause or infection may minimise the affect that it has had on the lungs. There are also many anti- inflammatory medications and other medications to relive the pain. In the case of pleural effusion darning the excessive fluid may also help the ease the symptoms.

Pleurisy is not contagious, however the infections and other problems such as flu and colds can cause the disease. To avoid pleurisy, people must remain socially distance from those who are sick and take vaccines to prevent viruses that may cause infections. Apart from that treating any respiratory tract promptly can also reduce the risk of pleurisy (Better health channel, 2018)

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