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SHUST HAP 605

**The Case of the Coughing Housewife**

Jessica, a fifty-nine year old mother of four, moved from a ranch in Colorado to Los Angeles, after the death of her husband, to be closer to her oldest son and his family. She has been in Los Angeles for 18 months and has noticed that she is experiencing shortness of breath which has worsened over the last six months. For the last week, she has been coughing and bringing up yellow mucus. She also noticed swelling in her ankles so she decided to visit a physician about her condition.

Jessica's family and medical history include a negative history of **asthma** or allergies, lack of occupational or home exposure to asbestos, a previous smoking history (one package of cigarettes per day between the ages of 16 and 52), episodes of **bronchitis**, treated with antibiotics on an outpatient basis, and a positive history of heart disease (father at 52 and brother at 56). Jessica has no history of serious illness, including heart disease, and her weight is within five pounds of her "desired" weight. She usually coughs in the morning to "clear her throat", but there is usually only a small amount of white mucus.

Her nurse practitioner conducts a general physical examination with the following results. Jessica's skin is normal (no rashes or **cyanosis**) and her nervous system is functioning normally. Her body temperature was 98.4°F while her pulse was regular at 95 beats per minute with an occasional premature beat. Jessica's blood pressure was within normal limits, however her jugular veins were slightly distended. Her respiratory rate was 28 breaths per minute; she breathed with pursed lips and used her accessory respiratory muscles more than would be expected. Jessica presented with a barrel chest and mild **dyspnea** when climbing onto the examination table. When listening to her breathing, the nurse practitioner noticed that Jessica had prolonged expiration accompanied by expiratory wheezes. Evaluation of her abdomen indicated no masses or tenderness, but she presented with both hepatomegaly and splenomegaly. All of her extremities were normal with the exception of bilaterally pedal **edema**.

Based on these results, the nurse practitioner suspected a pulmonary disorder and, after consultation with a physician, ordered laboratory tests (blood and sputum), **spirometry** and chest x-rays. The results of the laboratory tests were as follows: plasma bicarbonate = 38 mEq/L, hematocrit = 49%, white blood cell count = 9000, pH = 7.38; PaCO2 = 56, and PaO2 = 54. Analysis of the sputum sample indicated the presence of epithelial cells, polymorphonucleocytes and gram positive diplococci. Jessica's 1 second forced expiratory volume (FEV1) was 1.5 L/sec and her forced **vital capacity** (FVC) was 4 L. These values were 40% and 83% of normal, respectively. Results of the chest x-ray indicated scarring and hyperinflation of the lungs.

The results of these tests coupled with the physical examination and history lead to a diagnosis of **emphysema**. Jessica was prescribed antibiotics for the infection and oxygen by nose as well as a β2-agonist nebulizer as an acute treatment and requested to stay for observation and stabilization. After Jessica's condition was stabilized she was discharged and given a prescription for an inhaler containing a β2-agonist to be used as needed. She was also encouraged to exercise regularly and follow the nutritional guidelines she was given. Jessica was also informed that if the symptoms either worsened or did not lessen within the next week, to return and her treatment would be reevaluated and would possibly include nocturnal oxygen and an inhaler containing corticosteroids.

1. Define the words in bold.
2. What risk factors and symptoms did Jessica present with prior to the physical examination that suggested a pulmonary disorder?
3. How did the physical examination, chest X-ray and spirometry confirm this hypothesis?
4. Identify muscles involved in respiration and how these muscles are responsible for the process of ventilation.
5. How will the β2-agonist in the inhaler help with the respiratory problems Jessica presents with?
6. Why is it important that a β2-agonist and not simply an β-agonist is used in the inhaler?
7. If her condition does not progress, why would corticosteroids be used in the inhaler?