

Lecture 7 : Critical Care Nursing

Pneumonia:

Pneumonia is a pulmonary infection with inflammation that develops after someone inhales airborne pathogens or aspirates pathogens in secretions from the upper respiratory or gastrointestinal tract.

Classification of pneumonia:

According to causes :

- Bacterial (the most common cause of pneumonia)
- Viral pneumonia
- Fungal pneumonia
- Chemical pneumonia (ingestion of kerosene or inhalation of irritating substance)
- Inhalation pneumonia (aspiration pneumonia)
- Community-acquired pneumonia is pneumonia that someone contracts outside the hospital setting. In many cases, a respiratory virus, such as influenza . The most common bacterial cause is Gram-positive Streptococcus pneumonia .
- Nosocomial (hospital-acquired) pneumonia develops more than 7 days after hospital admission. It's likely to be caused by different pathogens, including Staphylococcus aureus and Klebsiella.

According to areas involved:

- **Lobar pneumonia:** if one or more lobe is involved
- **Broncho-pneumonia:** the pneumonic process has originated in one or more bronchi and extends to the surrounding lung tissue.

Mode of transmission:

Ways you can get pneumonia include:

- Bacteria and viruses living in your nose, sinuses, or mouth may spread to your lungs.
- You may breathe some of these germs directly into your lungs (droplets infection).
- You breathe in (inhale) food, liquids, vomit, or fluids from the mouth into your lungs (aspiration pneumonia).

Predisposing factors of Pneumonia:

- Immuno-suppressed patients
- Cigarette smoking
- Difficult swallowing (due to stroke, dementia, parkinsons disease, or other neurological conditions)
- Impaired consciousness (loss of brain function due to dementia, stroke, or other neurological conditions)
- Chronic lung disease (COPD, bronchitis)
- Frequent suction
- Other serious illness such as heart disease, liver cirrhosis, and DM
- Recent cold, laryngitis or flu

Pathophysiology of Pneumonia:

- The streptococci reach the alveoli and lead to inflammation and pouring of an secretions into the air spaces.
- WBCs migrates to alveoli, the alveoli become more thick due to its filling by secretions, involved areas by inflammation are not adequately ventilated, due to secretion and edema.

This will lead to partial occlusion of alveoli and bronchi causing a decrease in alveolar oxygen content.

- Venous blood that goes to affected areas without being oxygenated and returns to the heart. This will lead to arterial hypoxemia and even death due to interference with ventilation.

Clinical manifestations of Pneumonia:

- Shaking chills
- Rapidly rising fever (39.5 to 40.5 degree)
- Stabbing chest pain aggravated by respiration and coughing
- Tachypnea, nasal burning.
- Patient is very ill and lies on the affected side to decrease pain
- Use of accessory muscles of respiration e.g. abdomen and intercostals muscles
- Cough with pus, staining of blood , rusty sputum.
- Shortness of breath
- Flushed cheeks
- Loss of appetite, low energy, and fatigue
- Cyanosed lips
- Muscle pain

Diagnostic tests of Pneumonia:

- History taking
- Physical examination
- Chest x-ray

- Blood test(WBC)
- Sputum culture
- Urine antigen tests.

Treatment of Pneumonia:

- Antibiotic, depending on sputum and blood culture (Azithromycin 500mg ,Doxycycline 100mg,Ceftriaxone 1-2 G).
- Oxygen therapy
- Chest physiotherapy
- Maintain airway clearance(trachea suction)
- Monitor temperature anti-fever if needed.

Nursing intervention:

- Maintain a patent airway and adequate oxygenation.
- Obtain sputum specimens as needed.
- Use suction if the patient can't produce a specimen.
- Perform chest physiotherapy.
- Provide a high calorie, high protein diet of soft foods.
- To prevent aspiration during nasogastric tube feedings, check the position of tube, and administer feedings slowly.
- To control the spread of infection, dispose secretions properly.
- Provide a quiet, calm environment, with frequent rest periods.
- Assess the patient's respiratory status. Auscultate breath sounds at least every 4 hours.
- Monitor fluid intake and output.

- Evaluate the effectiveness of administered medications.
- Monitor the patient's arterial blood gas (ABG) levels, if hypoxic.
- Explain all procedures to the patient and family.

Preventive measures of Pneumonia:

- Frequent turning of bed ridden patients and early ambulation as much as possible.
- Coughing and breathing techniques.
- Sterilization of respiratory therapy equipment
- Suctioning of secretion in the unconscious who have poor cough and swallowing reflexes, to prevent aspiration of secretions and its accumulation.

Prognosis of Pneumonia:

- With treatment, most patients will improve within 2 weeks. Elderly or very sick patients may need longer treatment.

Complications of Pneumonia:

- Acute respiratory distress syndrome (ARDS)
- Pleural effusion
- Lung abscesses
- Respiratory failure (which requires mechanical ventilator)
- Sepsis, which may lead to organ failure

Patient education:

- Hand hygiene
- Asthma control
- Yearly flu immunization .