

Difference Between Pneumonia and Pneumonitis

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Key Difference – Pneumonia vs Pneumonitis

Air pollution and the poor quality of the air we inhale have increased the incidence of respiratory disorders by several folds. Pneumonia, which is defined as the invasion of the lung parenchyma by a disease-causing agent (mostly bacteria), evoking exudative solidification of the (consolidation) pulmonary tissue, made headlines in the world media few times in the recent years. The term pneumonitis, on the other hand, is used to describe the inflammation of the pulmonary tissues that is caused by the non-infectious agents. Although both conditions are associated with the inflammation of the lung tissues, **in pneumonia, the inflammation is due to infectious agents, but in pneumonitis, the inflammation is caused by non-infectious agents.** This is the key difference between pneumonia and pneumonitis.

What is Pneumonia?

Pneumonia is the exudative solidification (consolidation) of the pulmonary tissue caused by the invasion of the lung parenchyma by a disease-causing agent.

Criteria for the Classification of Pneumonia

- According to the causative agent

Bacterial, viral, fungal

- According to the gross anatomic distribution of the disease

Lobar Pneumonia, Bronchopneumonia

- According to the place where the pneumonia is acquired

Community-acquired, hospital-acquired

- According to the nature of the host reaction

Suppurative, fibrinous

Pathogenesis

The normal lung is devoid of any disease-causing organisms or substances. The respiratory tract has several defense mechanisms aimed at preventing the entry of these disease-causing agents.

- **Nasal clearance** – particles deposited in the front of the airway on the non-ciliated epithelium are normally removed by sneezing or coughing. The particles deposited posteriorly are swept over and will be swallowed.
- **Tracheobronchial clearance** – this is accompanied by mucociliary action
- **Alveolar clearance** – phagocytosis by alveolar macrophages.

Pneumonia can result whenever these defenses are impaired or the host resistance is decreased. Factors such as chronic diseases, immunosuppression and use of immunosuppressive drugs, leukopenia, and viral infections affect the host resistance making the host vulnerable to get this kind of disorders.

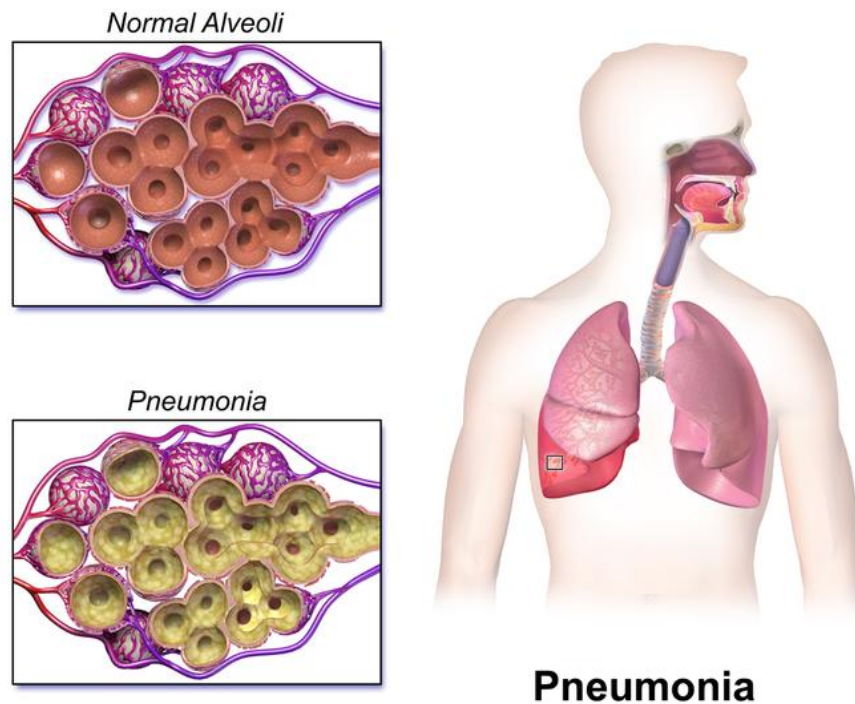


Figure 01: Pneumonia

The clearance mechanisms can be damaged in several ways,

- Suppression of the cough reflex and the sneezing reflex – Secondary to coma, anesthesia or neuromuscular diseases.
- Injury to the mucociliary apparatus – Chronic smoking is the major reason for the destruction of the mucociliary apparatus.
- Interference with the phagocytic action
- Pulmonary congestion and edema
- Accumulation of pulmonary secretions in conditions such as cystic fibrosis and bronchial obstruction.

Bronchopneumonia

- *Staphylococci, Streptococci, Pneumococci, Haemophilus, and Pseudomonas auregenosa* are the main causative agents.

Morphology

- Foci of bronchopneumonia are consolidated areas of acute suppurative inflammation. The consolidation may be patchy through one lobe but is more often multilobar and frequently bilateral.

Lobar Pneumonia

- Main causative agents are *pneumococci, klebsiella, staphylococci, streptococci*

Morphology

Four stages of inflammatory response have classically been described.

- **Congestion**

The lung is heavy, boggy, and red. This stage is characterized by vascular engorgement, intra-alveolar fluid with few neutrophils, and often the presence of numerous bacteria.

- **Red hepatization**

Congestion is followed by red hepatization which is characterized by massive confluent exudation with red cells, neutrophils, and fibrin filling the alveolar spaces.

- **Gray hepatization**

In the gray hepatization stage because of the progressive disintegration of the red blood cells that have accumulated in the alveolar spaces, lungs assume a gray color. This grayish appearance is enhanced by the presence of the fibrino suppurative exudate.

- **Resolution**

During the final stage of the pathogenesis, the consolidated exudate that has accumulated within the alveolar spaces undergoes progressive enzymatic digestion to produce a granular semi-fluid debris that is reabsorbed and ingested by macrophages or coughed up.

Complications

- Abscess – because of the tissue destruction and necrosis
- Empyema- as a result of the infection spreading into the pleural cavity
- Organization
- Dissemination into the bloodstream.

Clinical Features

- Acute onset of fever
- Dyspnea
- Productive cough
- Chest pain
- Pleural friction rub
- Effusion

Investigations

- Chest X-ray
- Sputum for culture
- Further investigations may be required to correctly identify the underlying pathology.

Management

The choice of antibiotics is based on the results of the culture of sputum. Sometimes surgical drainage of the mucus and sputum is necessary.

What is Pneumonitis?

Pneumonitis is the inflammation of the pulmonary parenchyma due to non-infectious causes. If untreated, the chronic inflammation can give rise to extensive fibrosis of the lung tissues. This decreases the compliance of the lungs, impairing the gas exchange that is principally manifested as breathlessness.

Causes

- Chronic exposure to various irritants such as pesticides, feathers, and dust.
- Chemotherapy and exposure to radiation
- Adverse effects of various drugs such as antibiotics

Symptoms

- Dyspnea
- Fatigue
- Sometimes chronic cough
- Other non-specific symptoms such as weight loss

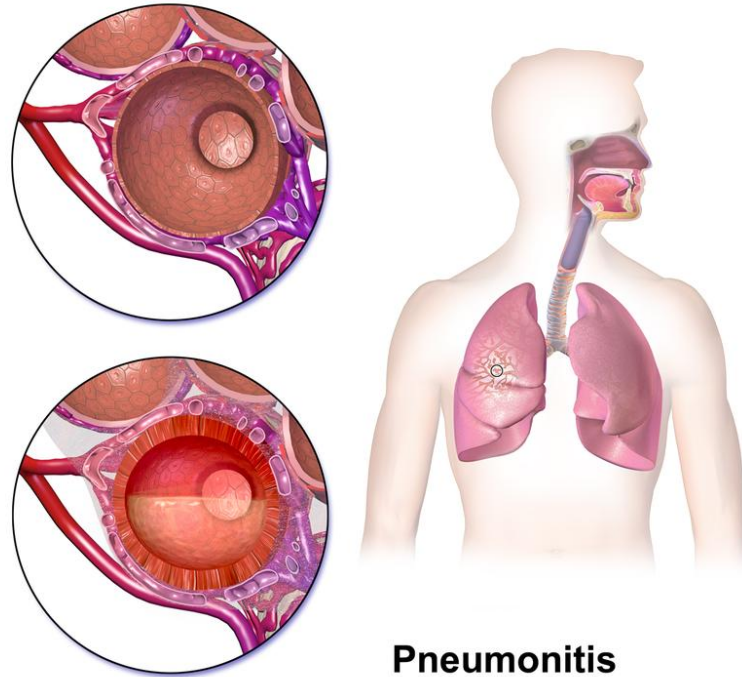


Figure 02: Pneumonitis

Diagnosis

The following investigations are used to arrive at a definitive diagnosis

- Chest X-ray
- CT
- Pulmonary function tests
- Bronchoscopy
- Rarely lung biopsy

Management

Oxygen therapy may be required if the patient is severely breathless. Corticosteroids are used as anti-inflammatory agents to control the ongoing inflammatory processes.

What is the Similarity Between Pneumonia and Pneumonitis?

- Both conditions are associated with the inflammation of the pulmonary parenchyma

What is the Difference Between Pneumonia and Pneumonitis?

Pneumonia vs Pneumonitis

Pneumonia is the exudative solidification of the pulmonary tissue caused by the invasion of the lung parenchyma by a disease-causing agent.

Pneumonitis is the inflammation of the pulmonary parenchyma due to non-infectious causes.

Inflammation

Inflammation is triggered by infectious agents mainly bacteria.

Inflammation is triggered by non-infectious agents such as radiation, drugs and various other irritants.

Complications

Untreated pneumonia can give rise to the following complications

- Abscess – because of the tissue destruction and necrosis
- Empyema- as a result of the infection spreading into the pleural cavity
- Organization
- Dissemination into the bloodstream.

Chronic inflammation of the pulmonary tissues can result in the irreversible fibrosis of lung parenchyma.

Tuning

The most common clinical features are,
· Acute onset of fever

The following symptoms can be seen in pneumonitis,

- Dyspnea
- Productive cough
- Chest pain
- Pleural friction rub
- Effusion

- Dyspnea
- Fatigue
- Sometimes chronic cough
- Other non- specific symptoms such as weight loss

Diagnosis

Chest X-ray and sputum for culture are done to identify the causative agent and the degree of disease spread.

Further investigations may be required to correctly identify the underlying pathology.

Chest X-ray, CT, pulmonary function tests, bronchoscopy and lung biopsy, are the investigations that are done to confirm the diagnosis.

Management

The choice of antibiotics is based on the results of the culture of sputum. Sometimes surgical drainage of the mucus and sputum is necessary.

Oxygen therapy may be required if the patient is severely breathless. Corticosteroids are used as anti-inflammatory agents to control the ongoing inflammatory processes.

Summary – Pneumonia vs Pneumonitis

Invasion of the lung parenchyma by a disease-causing agent (mostly bacteria) evokes exudative solidification of the (consolidation) of the pulmonary tissue known as pneumonia. Pneumonitis is the inflammation of the pulmonary parenchyma due to non- infectious causes. Although both conditions are associated with the inflammation of the lung tissues, the inflammation in pneumonia is due to

infectious agents, but in pneumonitis, the inflammation is caused by non-infectious agents. This is the basic difference between pneumonia and pneumonitis.

References:

1. Kumar, Parveen J., and Michael L. Clark. Kumar & Clark clinical medicine. Edinburgh: W.B. Saunders, 2009.

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