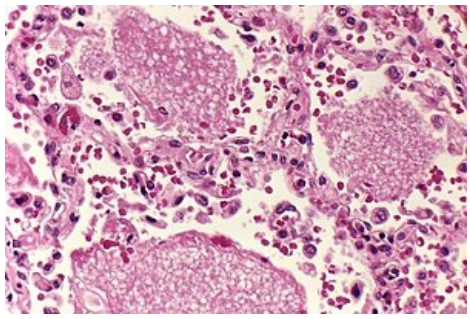
Pneumocystosis - disease

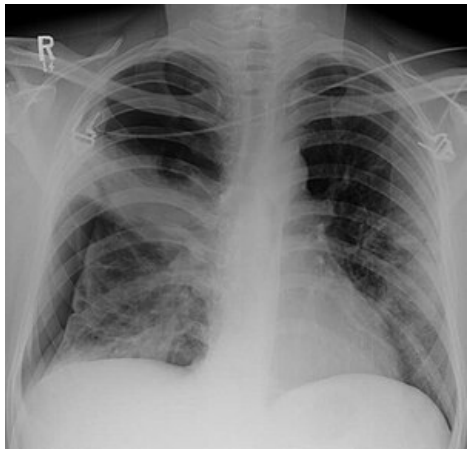
Pneumocystosis is an **infectious disease of the lungs** caused by the microorganism ***Pneumocystis jirovecii (carinii)***. This microorganism used to be a protozoan, but today it is classified as a **fungus**. There are 2 known morphologically distinct stages, that occur in the lungs – trophozoites and cysts.



Histopathological picture of lungs infected with Pneumocystis carinii in a patient with AIDS.

Pathogenesis

Pneumocystis carinii is commonly found in the environment, **both in the lungs of humans and animals**. However, in the healthy human population, pneumocystosis ***does not occur*** *in clinical form because the microorganisms are absorbed and eliminated by pulmonary macrophages. However, if the phagocytosis is defective, the microorganisms remain in the lungs, proliferate, and eventually fill the alveoli. They do not attack the alveolar walls and do not cause inflammation, so often pneumocystosis can be fatal.* Pneumocystosis **affects two different groups of patients.** The first group includes **newborns and malnourished children with an underdeveloped immune system**, the second group includes **adults with immunodeficient conditions** (long-term administration of immunosuppressive preparations, organ transplantation, administration of steroids and cytostatics, leukemia, cancer). Pneumocystosis is currently considered the most common infection in patients with acquired immune deficiency syndrome (AIDS).



X-ray of the lungs of a patient with pneumocystis carinii pneumonia.

Symptomatics

Pneumocystosis is manifested by **shortness** of breath, **unproductive irritating cough**, and often **fever**. Other possible complications are pneumothorax, pneumomediastinum (mediastinal emphysema), and pulmonary fibrosis in the case of chronic pneumocystosis. The disease can progress to **respiratory failure** and death.

Cases of disseminated pneumocystosis affecting the eyes, liver, and spleen have also been reported.

Histopathology

Microscopically, the alveoli are filled with a foamy eosinophilic mass that contains alveolar macrophages and *P. carinii* cysts and trophozoites. In addition, it may also contain hyaline membranes and type 2 pneumocytes. In newborns, the alveolar septa are coarse due to the presence of lymphoid cells and histiocytes. The alveolar-filling mass may be removed after phagocytic function is restored, otherwise its presence may lead to diffuse interstitial pulmonary fibrosis.

Diagnostics

Definitive diagnosis of pneumocystosis requires identification of the microorganism. Biological material (bronchopulmonary secretion) for examination of the presence of pathogens is obtained from bronchoalveolar lavage (**BAL**) or **transbronchial biopsy**. *P. carinii* is well visible in sections of **Gomori-Grocott staining** (methenamine silver strain), which stains the cyst walls black. Other methods are also used, such as Giemsa staining, which highlights the nuclei of trophozoites and intracystic bodies, or Gridley, or Gram-Weigert staining.

Treatment

Trimethoprim-sulfamethoxazole and **pentamidine** are effective in therapy. These substances are used in treatment but also as prophylaxis.

Links

Related articles

- Defects in cellular immunity

External links

- Pneumocystosis – Medscape (https://emedicine.medscape.com/article/225976-overview)

Source

- RUBIN, Edited by Emanuel – KARETNIKOV, John L. Farber; with 40 contributors; illustrations by Dimitri. *Pathology.* 2. edition. Philadelphia : Lippincott, 1988. ISBN 0397506988.

Portal: Pneumology Portal: Infectious medicine Portal: Microbiology