Granulomatous diseases and pathogenic microorganism.

[Article in Japanese]

Source
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Abstract
Granuloma formation is a chronic inflammatory reaction where macrophage system and other inflammatory cells are involved. After some antigen exposure and processing, T cells, macrophages, epithelioid cells, and giant cell are activated, and granulomas are formed. Granuloma is considered as a defense mechanism against antigens, which stay in the organs without inactivation. Granulomas including fibroblasts extra-cellular matrix surround and isolate the antigens. Granulomas are classified to noninfectious granulomas and infectious granulomas. However recent studies revealed pathogenic microorganism are suspected to be a cause of granuloma in non-inflammatory diseases. Balance between pathogenic microorganisms and defense mechanisms of the host might be important in the special immunologic reaction. In some cases, it is hard to clearly classify infectious and noninfectious granulomas. Recently, Eishi et al. reported that latent infection of Propionibacterium acnes might be cause of sarcoidosis. Several hypersensitivity pneumonias are considered to be caused by exogenous microorganisms. The symposium was organized to know and clarify the new mechanisms of non-infectious granulomatous lung diseases and pathogenic microorganisms. This report is a summary of a symposium entitled "Granulomatous Diseases and Pathogenic Microorganism", organized in the 82nd Japanese Society for Tuberculosis (president Dr. Mitsunori Sakatani, M.D.). 1. Imaging of Granulomatous Lung Diseases: Masanori AKIRA (Department of Radiology, National Hospital Organization Kinki-chuo Chest Medical Center) High-resolution computed tomography (HRCT) is a useful tool in the evaluation of parenchymal changes in patients with a granulomatous lung disease. In sarcoidosis, the HRCT findings include small, well-defined nodules in relation to lymphatic roots, lymph node enlargement, and middle or upper lobe predominance. The appearances of subacute hypersensitivity pneumonitis include ill-defined centrilobular nodules, ground-glass opacity, and air trapping especially on expiratory CT scan. Those of Langerhans cell histiocytosis include bizarre thin-walled lung cysts, centrilobular nodules and upper lobe predominance. Each of granulomatous lung disease has some characteristic HRCT appearances, but they all are non-specific for diagnosis. HRCT is also useful for grading of parenchymal changes in granulomatous lung diseases. 2. Histopathology of granulomatous lung diseases with
special reference to differential diagnosis of infectious disease: Tamiko TAKEMURA (Department of Pathology, Japanese Red Cross Medical Center) The lung is commonly involved by various granulomatous diseases of various etiology. It is difficult to pathologically differentiate these granulomatous diseases to conduct appropriate therapy, because of morphological similarity of epithelioid cell granuloma, variable etiology, and difficulty of identification of causative agents. Granulomatous diseases generally are divided into infectious and non-infectious ones for treatment. Although infectious granulomas usually reveal necrosis and abscess, non-infectious ones occasionally also reveal necrosis. In cases with granulomas in the lung, it is necessary to explore the etiologic agents including environmental ones.

3. Sarcoidosis and Propionibacterium acnes: Yoshinobu EISHI (Department of Pathology, Tokyo Medical and Dental University) P. acnes can cause latent infection in peripheral lung tissue and the mediastinal lymph nodes and persist intracellularly in a cell-wall-deficient form. This dormant form of P. acnes can be activated endogenously under certain environmental conditions (hormones, stress, living habits, etc.) and proliferate in cells at the sites of latent infection. Granulomatous inflammation occurs in sarcoidosis patients with hypersensitivity to intracellular proliferation of the cell-wall-deficient bacteria, which can infect other cells or organs when spread via the lymphatic or blood streams. The timely use of antibiotics may not only kill the bacteria proliferating at the site of disease activity, but also prevent endogenous activation of P. acnes. If long term administration of antibiotics eradicates dormant forms of the bacteria persistent in organs, it may lead to complete remission of sarcoidosis.

4. Farmer's lung and thermophilic actinomycetes: Takashi MOURI (Pulmonary Division, Iwate Prefectural Kitakami Hospital), Kohei YAMAUCHI, Hiroshi INOUE (Third Department of Internal Medicine, Iwate Medical University, School of Medicine), Kazuki KONISHI (Morioka Tsunagi Onsen Hospital) Farmer's lung is caused by the allergic reaction to inhalation of thermophilic actinomycetes. Acute symptoms are chill, fever, cough and dyspnea. Fine crackles is characteristic. Pathologically, alveolitis with lymphocytes infiltration and epithelioid cell granuloma and Masson's body are characteristics. Bronchoalveolar lavage analysis shows elevated lymphocytes and diverse CD4/8 ratio (high in average). Isolation from the environment improves the symptoms. Sometimes patients need steroid therapy, 0.5 to 1.0 mg/kg of prednisolone. Pulse therapy can be applied for severe cases. SLX analogue can prevent lymphocytes infiltration and granuloma formation in mice model. Some of acute farmer's lung show poor long term prognosis, showing emphysematous, fine granular or small nodules in chest CT. These chronic farmer's lung might be diagnosed as IIPs. 5. Hot tub lung: Takashi OGURA (Kanagawa Cardiovascular and Respiratory Center) Hot Tub Lung (HTL) is a disorder caused by exposure to Mycobacterium avium complex (MAC) organisms contaminating hot tub water. Whether this disease represents true infection or hypersensitivity pneumonitis is controversial. Recent reports support the theory that this disease represents a hypersensitivity pneumonitis rather than infection. The physicians should suspect a hypersensitivity pneumonitis reaction to MAC in the investigation of patients with hypersensitivity pneumonitis of unknown cause.

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