CASE REPORT

Occupational Hypersensitive Pneumonitis in Medical Staff

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SUMMARY

The article discusses the relevance of increasing the incidence of occupational allergoses among medical staff. A clinical case of the development of occupational hypersensitive pneumonitis in a nurse vaccination office is characterized by development of systemic multi-organ disorders.

Keywords: allergy, occupational hypersensitive pneumonitis, medical staff

INTRODUCTION

Medical staff is constantly exposed to a complex of occupational factors of physical, chemical, biological nature, and its individual organs and systems are subjected to functional stress. The most frequent occupational diseases in medical staff are allergoses: bronchial asthma, rhinitis, allergic dermatitis, anaphylactic shock[1,2].

Occupational hypersensitive pneumonitis (OHP) is an immunological lung disease resulting from lymphocytic and often granulomatous inflammation of the peripheral respiratory tract, alveoli and surrounding interstitial tissues, which develops as a result of non-IgE-mediated allergic reaction to various organic materials or low molecular weight agents present in the workplace. Diagnosis of OHP requires a multidisciplinary approach and relies on a combination of diagnostic tests to establish the working genus of the disease. Both clinical and professional history are key to diagnosis and often lead to initial suspicion.

In spite of the multiple attempts at systematization and the publication of expert consensus statements, and standardizing diagnostic methods and criteria of OHP remain particularly difficult[3].

As European Academy of Allergy and Clinical Immunology position paper sad that the most important part of treatment is early removal from exposure to the eliciting antigen, although the disease may show an adverse outcome even after avoidance of exposure to the causal agent[4].

This publication will present a case of an occupational hypersensitive pneumonitis in a medical stuff with the development of systemic multi-organ disorders.

CASE REPORT

Patient M., born in 1956, observed in the Department of occupational pathology in Ryazan regional clinical hospital from 2004 to the present. Until 2004, for 23 years, she worked as a nurse in the vaccination room in contact with a complex of substances of sensitizing and irritating action: vaccines, toxins, disinfectants.

She was first admitted in June 2004 with complaints of chills, dyspnea on mild exertion, palpitations, pain and sore throat, dry cough, pain in the joints of the hands and feet. From the anamnesis: her complaints appeared in autumn, 2003 after her working activity - TB vaccinations, Mantoux tests. She was selftreated during 3 months with antihistamines, paracetamol. Worsening of her condition was since January 2004, the recurrence of the above symptoms has been observed after massive contact with tuberculin at her work. She was diagnosed with acute bronchitis and treated with antibiotics, bronchodilators. In April 2004, severe articular syndrome joined. She was suspected myocarditis and hospitalized in the cardiology department, where the following diagnosis was made: allergosis to tuberculin with nonspecific myocarditis, polyarthralgia, chronic obstructive bronchitis. The patient was admitted to occupational diseases department.

From the life history we emphasize a nodular euthyroid goiter, osteoarthritis of knee joints, chronic tonsillitis. There is no hereditary diseases and harmful habits. On physical examination: general condition is satisfactory. The skin and visible mucousa are pale. There is cyanosis of the lips. There is no peripheral edema. There is deformity of the metatarsophalangeal, proximal interphalangeal joints 2-4 fingers, terminal phalanges of the type "drumsticks", nails of the type "watch glasses". Lungs percussion reveals bandbox sound. At auscultation there is vesicular breathing with crackling rales, breathing rate - 20 per minute. Heart tones are diminished, the rhythm is correct. Heart rate is 78 per minute, arterial blood pressure -120/80 mm Hg. The abdomen is soft and painless. Liver and spleen are not enlarged.

Results of laboratory-instrumental investigations: General blood test: erythrocytes – $3,9*10^{12}$/l, HB – 118 g/l, color index – 0,9, leukocytes –$7,2*10^{9}$/l, stab – 4%, segmented – 59%, lymphocytes – 29%, monocytes – 7%, eosinophil – 1%, ESR – 42 mm/h. Urinalysis was without pathology. Biochemical blood test : total bilirubin – 14,8 µmol/l, glucose – 3,7 mmol/l, AST – 0,63 µmol/l, ALT – 0,79 mmol/l, total protein 66 g/l, albumins – 40,4%, α_2 - globulins - 9,4%, α_1-globulins - 7,5%, β- globulins - 12,7%, γ - globulins - 30%, creatinine - 0,08 mmol/l, lactate dehydrogenase (LDH)-810 u/l*h, LDH_{1+2} - 77,62 u/l*h, Creatinphophokinase - 102,5 u/l*h, Rheumatiod Factor – negative, LE cells were not found. Test for allergic leukocytolysis with tuberculin was positive + 31%.

On chest X-ray there was diffuse pneumofibrosis. On spirometry there are moderate obstructive and restrictive changes, salbutamol test was negative. Conclusion of bronchoscopy: bilateral diffuse endobronchitis stage I. Histological examination of the bioptate: the histological picture does not contradict the diagnosis of fibrosing

alveolitis. Echocardiography revealed moderate impairment of left ventricular diastolic function and signs of atherosclerosis of aorta. Ultrasound of abdominal cavity was without pathology.

Rheumatologist suspected systemic connective tissue disease – drug induced disease of occupational origin, with vasculitis, polyarthritis, alveolitis, activity 2 degree. Finally, the pulmonologist's conclusion was: fibrosing alveolitis, probably an occupational.

The patient was consulted in the regional clinical antituberculous dispanser due to presence of diffuse disseminated pulmonary process on x-ray. Data for pulmonary tuberculosis were not available. Based on the results of examination, the diagnosis was made: diffuse pulmonary fibrosis. Therapy with glucocorticosteroids was prescribed: triamcinolone 36 mg orally per day, budesonide inhalation 800 µg per day, the patient was removed from contact with allergens. She was recognized as invalid.

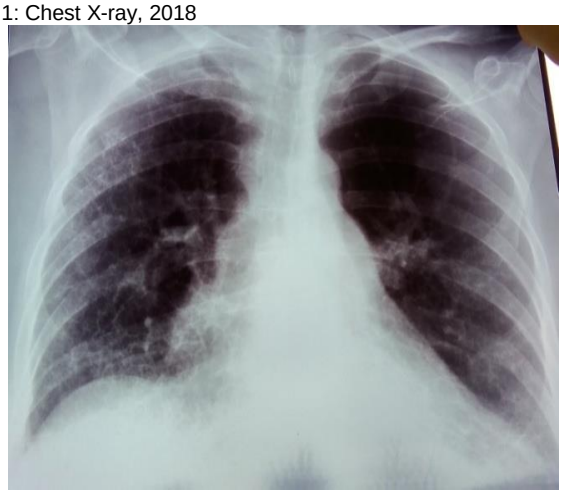
Paying attention to the peculiarity of this case: the presence of systemic cardiac and articular manifestations in the onset of the disease, the patient was sent to the Research Institute of labor medicine in November 2004. Upon admission, the patient noted the development of drug-induced Cushing's syndrome. Despite the prolonged use of corticosteroids and the elimination of causative factors, the examination revealed signs of continued activity of hypersensitive pneumonitis: leukocytosis $10.2*10^9$/l in peripheral blood, increased ESR - 32mm/h, hypergammaglobulinemia, increased LDH activity, increased immunoglobulins, circulating immune complexes, presence of imbalance of cellular and humoral immunity: increased CD 8 (T-suppressors) – 62,9%, CD 3 (T-General) – 94,2%, reduction of CD 16 (normal killers) – 2,5% and CD 20 (B-total) – 0,9% according to flow-laser cytometry; and absense of positive radiological diagnostics.

Additional investigations: immunological blood analysis reveales elevation of IgA – 4,74g/l, IgM – 3,08 g/l, IgG – 17,3 g/l, IgE – 368 kE, the circulating immune complexes – 14,8 U; leukocyte inhibition test with the tuberculin was positive - increased emigration of leucocytes + 62%. Based on the survey data and submitted documents clinical-expert Commission made the diagnosis: Occupational hypersensitive pneumonitis from exposure to immunological factors, such as tuberculin and others, chronic course, stage of moderate activity. Emphysema. Respiratory failure II-III.

From 2004 the patient was under observation in the regional clinical hospital. She is under the treatment with fluticasone, formoterol, ipratropium bromide, acetylcysteine, oral corticosteroids during the exacerbation. Since 2010, the patient showed signs of a chronic cor pulmonary.

During last hospitalization in 2018 the patient complained about general weakness, fatigue, dyspnea on mild exertion, dry cough, sweating, dizziness, pastosity of hands, feet, heartbeat, retrosternal pressing chest pain during exercise. On the chest X-ray there are multiple focal shadows from 2 to 4 mm in diameter, mainly in the lower parts of both lungs. There are areas of bullae up to 2 mm. The roots are dilated with petrifications on the left side (Fig.1).

Fig.1: Chest X-ray, 2018



DISCUSSION AND CONCLUSION

Thus, during the 15-year follow-up period of patient M. there is a progression of the disease with the development of complications, which is confirmed by clinical and instrumental data.

In conclusion, it should be noted that many occupational factors in medical staff work are full allergens or have a strong irritating effect on the nasal mucosa and pulmonary tissue, which should be taken into account during preliminary and periodic medical examinations[2,5]. Over the past decades, there has been an intensive increase in the prevalence of allergic diseases, the prevention and treatment of which is currently one of the most important medical and social problems for healthcare. The problem of increasing the incidence of occupational allergies among medical staff is relevant[1,6].

Declaration of author's competing interests: The authors declare no conflict of interest.

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