

CASE REPORT

**Papular-purpuric Gloves and Socks Syndrome in a 46-year-old Man with
Mycoplasma pneumoniae Respiratory Disease**

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ABSTRACT

Mycoplasma pneumoniae is a cause of upper and lower respiratory disease, predominantly in children and young. Dermatologic manifestations of the infection occur in 1-5% of the cases, most commonly as Stevens–Johnson syndrome and erythema multiforme. We present a 46-year-old previously healthy man heavy smoker, who was admitted due to fatigue, chest pain, cough, and fever that appeared seven days earlier. He was diagnosed pleuro-pneumonia caused by *Mycoplasma pneumoniae*. Apart from bicytopenia as toxic extrapulmonary manifestation of the infection, he developed a relatively novel pruritic dermatosis - papular-purpuric gloves and socks syndrome (PPGSS). Under antibiotic treatment, disease had favorable outcome. In the cases of PPGSS without known etiologic agent, testing for *Mycoplasma pneumoniae* might be useful to reveal etiology of the syndrome, especially in adult subjects. Some of the known constitutional symptoms of PPGSS such as fever and fatigue, may also belong to the co-existing viral or bacterial infection. *J Microbiol Infect Dis* 2018; 8(4):158-161.

Keywords: complications, *Mycoplasma pneumoniae*, Papular-purpuric gloves and socks syndrome

INTRODUCTION

Papular-purpuric gloves and socks syndrome (PPGSS) is an acute, relatively novel, self-limited, often febrile pruritic dermatosis [1]. It usually appears in distal parts of the extremities in a gloves and socks pattern with symmetric edema and erythema of the hands and feet [2]. Sometimes, PPGSS is also associated with purpura while petechiae rarely appear. Papular, petechial, and purpuric acral dermal and mucosal lesions are seen usually in children and young adults [3]. The majority of patients with PPGSS make a full recovery, since the dermatosis usually disappears within one or two weeks [4]. Apart from topical steroids and bed rest, therapy includes non-steroid anti-inflammatory drugs [2].

Most of the documented PPGSS cases have been reported to be caused by viruses, reported mainly in children and adolescents [3-5]. Parvovirus B19 is considered as the major causative agent although other viruses have

also been reported [3-6]. In 2011, Pemira & Tolan [7] reported a novel association of the PPGSS with *Mycoplasma pneumoniae* in pediatric practice.

We aimed to present an adult patient with lower respiratory infection caused by *Mycoplasma pneumoniae*, who developed PPGSS with its both components (gloves and socks) together with other rare extrapulmonary complications. Ethical Board of the Clinical Center of Serbia, Belgrade has approved the presentation to be published in a medical journal (1397/1).

CASE REPORT

A 46-year old man has been admitted due to fatigue, chest pain, productive cough, and fever. History taking revealed that the symptoms of possible lower respiratory tract infection in previously healthy subject smoker (45 pack/years) appeared seven days earlier. On admission, he was sub-febrile without dyspnea and cyanosis while the inspection of the upper

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and lower extremities showed signs of PPGSS (Figures 1-3). Lungs were clear to auscultation except over left lower part where the sound was diminished. The heart rate: 80/min, cardiac rhythm, respiratory rate as well as the rest of the findings were normal.

Peripheral blood laboratory analysis showed erythrocyte sedimentation rate: 80/per the first hour, CRP: 120 mg/L, WBC: $0.9 \times 10^9/l$, platelets: $116 \times 10^9/l$, hypoalbuminemia, decreased levels of serum urea and creatinine. Urine analysis was positive for proteins.

Standard postero-anterior chest x-ray showed signs of left sided pleural effusion up to the anterior fourth intercostal space. Echocardiography revealed a small circular pericardial effusion of 2-3 mm while the rest of the cardiac findings were normal.



Figure 1. Left hand "glove sign" as a part of Papular-purpuric Gloves and Socks Syndrome in Adult Patient with *Mycoplasma pneumoniae* Respiratory Infection.

Further hematologic examination has been performed due to existing bicytopenia. Hemostasis analysis showed increased coagulation factor V, and decreased factors VII and XII. Bone marrow aspirate analysis revealed the hypocellularity and toxically modified bone marrow. Immunological analysis showed increased titer for ANA Hep2: 1:640.

Serohemorrhagic pleural fluid obtained by repeated thoracentesis (2300 ml in total) was proved to be an exudates and pleural biopsy was performed. Histologic examination of the pleural specimen revealed purulent chronic

fibrous pleuritis. Combination of ceftriaxone and ciprofloxacin intravenous therapy started.



Figure 2. Right hand "glove sign" as a part of Papular-purpuric Gloves and Socks Syndrome in Adult Patient with *Mycoplasma pneumoniae* Respiratory Infection.



Figure 3. "Socks part" of the Papular-purpuric Gloves and Socks Syndrome in the patient with *Mycoplasma pneumoniae* Respiratory Infection. On the plantar side of the feet, only the fifth finger and the middle parts of the soles were still covered by intact skin. The rest has been peeled off in just one act like a sock.

Microbiologic analyses of sputum and pleural fluid samples were negative for pathogenic agents, including mycobacteria, and serological analysis finally confirmed positive result for *Mycoplasma pneumoniae* IgM antibodies. The antibiotic therapy, which included fluoroquinolone I.V. (together with cephalosporin) from the very beginning, and continued with seven days of clarithromycin as

the first line antibiotic for *M. pneumoniae*, has led to full recovery within three weeks.

DISCUSSION

Dermatologic complications of *M. pneumoniae* respiratory disease occur in 1-5% of the patients, most commonly as Stevens-Johnson syndrome or erythema multiforme [8]. We demonstrated PPGSS which has not been reported in adult patient in relation to *M. pneumoniae* yet. 'Gloves' part of the PPGSS, present in our patient, has never been reported in an adult subject whatever the causative agent has been detected.

Airborne *M. pneumoniae* related respiratory infection occurs worldwide without seasonal variation but proportionally higher incidence in summer and fall. Epidemiologic studies revealed that epidemic occur every 4-8 year [9,10]. *M. pneumoniae* is the smallest of all free-living infectious agents. Lack of cell wall put it close to viruses and limits therapeutic approach - use of cell wall synthesis inhibitors. Its toxic metabolic products are peroxide and superoxide, and inhibition of catalase activity is one of its basic features. Although all ages are at risk, *M. pneumoniae* disease mostly appear in children and young (5-20 years). Tracheobronchitis and atypical pneumonia (walking pneumonia) are most frequent manifestations of *M. pneumoniae* respiratory infection. Pneumonia appears in only 3-10% of subjects with *M. pneumoniae* infection, but the agent is cause of about one third of all pneumonias. Fifteen per cent of pneumonias among older than 40 years are caused by it [11].

Clinical syndrome is characterized by fever, headache and malaise that happen after 2-3 weeks incubation, followed by persistent non-productive cough and other respiratory symptoms. Radiological signs precede symptoms. Clinical presentation of *M. pneumoniae* respiratory disease may vary from mild to severe and life-threatening condition [12]. Disease generally has good prognosis such as it has happened in our presented patient.

Pathomechanisms of *M. pneumoniae* extrapulmonary manifestations and especially skin lesions remain largely unknown [13]. Having in mind the biological features of *M. pneumoniae*, its direct infection and propagation

to skin squamous epithelium seems less probable. Hematogenously transferred to dermis, it may rather act through cytokines production that leads to a variety of skin lesions. Depending on the role of certain cellular structures and inflammatory cytokines, extrapulmonary manifestations of the infection could be divided to three categories: direct, indirect and vascular occlusion type [13]. It is considered that immune modulation might be important in an indirect type, especially autoimmunity through interplay between human cell and components of bacterial wall.

Autoimmune extra-pulmonary manifestations can occur even in the absence of chest reactions as well as before, during or after them. It is possible that increased titer for ANA Hep2 found in our patient has acted in pathogenesis of presented complications. On the other hand, in vascular occlusion type, it is considered important that the agent may induce vasculitis/thrombosis either associated with hypercoagulable state or without it.

Apart from skin, extrapulmonary manifestations of *M. pneumoniae* respiratory disease include heart, ocular, rheumatologic, gastrointestinal, neurologic, and hematologic involvement [13]. Hemolytic anemia, thrombocytopenia and thrombotic thrombocytopenic purpura have been reported in *M. pneumoniae* pneumonia [14]. Our patient had bicytopenia (leuko- and thrombocytopenia) as severe toxic complication demonstrated by bone marrow aspirate analysis.

When it comes to clinical presentation of the PPGSS alone, skin lesions usually appear after a period of constitutional symptoms such as fever, myalgia, arthralgia, asthenia, or they erupt synchronously with them. Lymphadenopathy, gastrointestinal or respiratory symptoms may also be found [15]. In our presented case, constitutional symptoms could be equally attributed to the existing *Mycoplasma* infection. Even more overlappingly, PPGSS has been reported as associated with mild anemia, reticulocytopenia, leucopenia, and thrombocytopenia, and majority of the hematologic conditions are also reported to be rare complications of *Mycoplasma pneumoniae* lower respiratory tract infection [13,14].

Conclusion

Testing for *Mycoplasma pneumoniae* might be useful in revealing etiology of the PPGSS, especially in adult subjects. *M. pneumoniae* lower respiratory infection usually has favorable disease outcome even when severe or rare extra-pulmonary complications happen. Some of the known constitutional symptoms of PPGSS such as fever and fatigue may belong to the co-existing infection.

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Ethical Board of the Clinical Centre of Serbia in Belgrade has approved the case to be reported in a medical journal (1397/1) and the statement is included in the text of the manuscript.

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