

Case Report

Nocardia infection of muscular and pulmonary in a membranous glomerulonephritis patient treated only by steroids: a case report and article review

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Abstract: Nocardiosis is an extremely rare infection, which usually happens in immunocompromised hosts. Here we report a case with muscular and pulmonary infection of Nocardia in a membranous glomerulonephritis patient only treated with steroids for immunosuppression. This case revealed an uncommon Nocardia infection site, and a disseminated Nocardiosis occurs in a mild immunosuppressed patient.

Keywords: Nocardiosis, muscular infection, pulmonary, membranous glomerulonephritis

Introduction

Nocardia infection is an opportunistic infection in immunosuppressed patients, often occurs on patients after strong immunosuppressive therapies or with serious immunodeficiency, such as organ transplantation patients, AIDS patients or patients with malignancies [1, 2]. The clinical manifestation of Nocardia infection is non-specific, the most common infection organs involved are skin, pulmonary and cerebrum [3]. As reported, there are only about 50 literatures of Nocardia infection until now, and only one case describe the Nocardia infection on a membranous glomerulonephritis patient treated with multiple immunosuppressive agents [4]. This is the first described case of Nocardia infection on a patient treated only with oral steroids with membranous glomerulonephritis, furthermore it is intramuscular infection which is the rare involved site for Nocardia.

Case presentation

A 54-year-old man admitted to The First Affiliated Hospital of Zhejiang University on September 1, 2015 because of multiple masses on lambs with pain for 1 month. Six months ago the patient underwent renal biopsy because of nephrotic syndrome, and the pathological

diagnosis was membranous nephropathy stage I-II. Since then he was given 48 mg Medrol per day by oral, reduced 4 mg per month. One month ago, he felt obvious pain of left upper leg, without abscess, fever and treatment. Three weeks ago, he had a fever and cough, considering having a cold, so was given cephalosporin. He had no fever and little cough after being treated. But more similar painful masses appeared on the other leg and arms, the ultrasonic manifestation heterogeneous echopattern masses with partially liquefied in another hospital, the WBC and CRP was normal, so they considered it is the side effect of steroids and gave him Celebrex for therapy, the pain was relieved, but the masses also existed. His renal function was stable during these time, taken 28 mg Medrol once a day when admission. He had taken aspirin 100 mg Per day because of ACS for 3 years, taken Approval 0.15 per day against hypertension, and had no myocardial infarction, no PCI, no tumor, no chronic pulmonary disease, no Diabetes mellitus, and his cardiac functional class was I when admission. During hospitalization period, he was found a diabetes considering related with steroids.

On examination, T 36.7°C, Bp 104/78 mmHg, both lungs sounds respiratory harshness, no rales, no murmurs in heart and no tenderness



Figure 1. Lungs CT scan and ultrasound visualization for Surface mass. A: CT scan showing a high density mass in the upper lobe of the left lung, with holes in it. B: Surface mass ultrasound showing heterogeneous echopattern masses with partially liquefied. C: Surface mass ultrasound showing heterogeneous echopattern masses and no liquefied in it.

in abdomen, both lower extremities was mild edema, multiple soft painful nodules in the deeply subcutaneously of the limbs, no obvious changes in the local skins. babinski's negative. Ultrasonographic evaluation showed heterogeneous echopattern masses with partially liquefied in them.

The examination's results were as following: BRT: WBC $13.6 \times 10^9/L$, N% 80.1%, L% 17.1%, HB 122 g/L, PLT $239 \times 10^9/L$; URT: protein ++, blood -; 24 hours urinary protein was 1.84 g. Blood biochemistry: albumin 27.3 g/L, globulin 21.8 g/L, ALT 24 U/L, AST 12 U/L, Cr 71 $\mu\text{mol/L}$, BUN 12.4 mmol/L, TB 9 $\mu\text{mol/L}$, TC7.04 mmol/L, TG 3.29 mmol/L, blood sugar 5.18 mmol/L; CRP 18.4 mg/L; PCT 0.05 ng/ml; ESR 80 mm/1 h; CA199 42.3 U/ml, ferritin 559 ng/ml, other tumor marks were normal. ANA, ANCA, APS were negative. ECG had no special. Glycosylated hemoglobin A1c 7.5%. Echocardiography showed left ventricular diastolic function slightly decreased and mild regurgitation of mitral valve and tricuspid valve. Renal and renal vascular ultrasound showed no obvious abnormalities; Carotid ultrasound showed Carotid atherosclerosis and plaque formation; Ultrasound of limbs' vascular showed no abnormality; Abdominal ultrasound showed hepatic adipose infiltration. Pulmonary CT scan showed a high density mass in the upper lobe of the left lung, with holes in it (**Figure 1A**). Surface mass ultrasound showed heterogeneous echopattern masses with partially liquefied (**Figure 1B, 1C**). Since the patient had membranous glomerulonephritis, and his Alb is lower than normal without fever, so we

continued to give him 28 mg/d Medrol. But the results of WBC count, CRP, pulmonary CT scan and the symptom of cough prompted maybe there was pneumonia, so we added piperacillin tazobactam 4.5 Q12H for anti-infection therapy. Combined the manifestation of lung CT scan and the ultrasound visualization for surface mass, infection diseases was first considered, but the patient has no fever, so tumor was need to be excluded. So we choose the largest mass which and Intern liquefaction to puncture and drainage under ultrasound, brown yellow turbid liquid was drained, which showed was more likely to be an infection. And the drainage fluid was cultured for bacteria, mycobacteria and fungi. At the same time we reduced Medrol to 16 mg/d. Five days later the cultured result showed Nocardia infection, and the cytological examination was negative.

When the patient was admitted, we used piperacillin tazobactam 4.5 q12h for empirical treatment, the patient had no fever and his cough was better after treatment, but also complained about masses pain and without masses diminution. And he was found diabetes mellitus during admission period which is considering Glucocorticoid related, and it is controlled well only by Acarbose 100 mg potid. After the puncturing and drainage, we reduced Medrol 16 mg daily. After the cultures suggested of Nocardia infection, antibiotics was changed to SMZ 2 q12h oral combined with Ofloxacin 0.5 QD static drop (after discharge changed to oral). Course of treatment was 3 to 6 months.

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After using SMZ and Ofloxacin, masses were diminished, and there was no pain and swelling of limbs anymore, no obvious cough and no fever, lower extremities edema regression. Laboratory examination results improved, as follows, BRT, WBC $14.0 \times 10^9/L$, N% 82.9%, L% 14.3%, HB 123 g/L, PLT $230 \times 10^9/L$. Blood biochemistry, albumin 31.3 g/L, globulin 19.7 g/L, ALT 28 U/L, AST 18 U/L, Cr 74 $\mu\text{mol/L}$, BUN 10.5 mmol/L, TB 7 $\mu\text{mol/L}$, TC 6.30 mmol/L, TG 3.62 mmol/L. CRP 5.8 mg/L. PCT 0.06 ng/ml. Patients were discharged on September 21, 2015.

Discussion

Nocardia infection is a rarely opportunistic infection disease usually occurs in immunocompromised patients, including organ transplant recipients, undergoing high-dose corticosteroid therapy patients, HIV infection patients, and patients with lymphoma or other malignancies [1, 2]. The most target organ of Nocardia infection is lung while the second favorite site is cutis or brain [5]. In a review by Cândida Abreu said that pulmonary Nocardiosis maybe subacute or chronic, and its signs and symptoms were not distinguished. Fever, anorexia, cough and haemoptysis may exist or not [3]. Skin and cutaneous Nocardiosis usually performed as superficial abscess or cellulitis without pain and slowly progressed. Structural pulmonary diseases and diabetes mellitus are the risk factors for Nocardiosis [6, 7].

As mentioned above, Nocardiosis usually happen on severe immunodeficiency patients, it is very rare that Nocardia infection occurred on a membranous glomerulonephritis patient, searching the Pubmed up to 2015, there was only one case report that Nocardiosis happened in a MGN patient [4]. In our case, the patient was a mild-aged man, with diagnosed for 6 months, found diabetes mellitus this admission period which is considered for Glucocorticoid related diabetes mellitus, and is controlled well only by Acarbose 100 mg tid. He had no chronic pulmonary diseases, no myocardial infarction history, no PCI and no tumor. The patient had diabetes, but 6 months ago his blood glucose was normal. So we considered it was steroids related. Though his glycosylated hemoglobin was a little higher than normal, its course was short, at least

no more than 6 months. The patient is only treated by oral corticosteroid therapy without high dose for 48 mg Medrol once daily, and monthly reduced 4mg, totally used for 6 months till now. While the reported patient [4] was a 71-year-old man, and he had a history of variety of chronic diseases, as followed, abdominal aortic aneurysm, atrial fibrillation, hypertension, heart insufficiency, chronic obstructive lung disease, liver cirrhosis, upper gastrointestinal bleeding and diabetes after steroids therapy for 6 months. Before the infection, that patient used many kinds of immunosuppressive agents, including steroids, three intravenous doses of cyclophosphamide, low-dose prednisone (10 mg/day) combined with mycophenolate mofetil (MMF, 2×500 mg/day). His creatinine clearance remained about 40 mL/min. That patient was died 3 weeks after discharging because of an acute cardiac event.

Pulmonary Nocardiosis is the most common manifestation which is the same to our, but intramuscular involvement is extremely rare. In fact, there were only six other published cases describing intramuscular infection [4, 8]. John W et al [9] reviewed the literature about Nocardiosis showed that may occurred in lungs (64%), cutaneo (28%), cerebra (19%), and centralvenous catheter, eyes, heart valves, liver, spleen, adrenal glands, thyroid gland was reported respectively.

As we known, Nocardia infection has a high morbidity and mortality disease. The morbidity and mortality of disseminated Nocardiosis in immunosuppressed patients is about 37% and about 7% to 85%, respectively [10]. Sulfamethoxazole-trimethoprim was the standard treatment of Nocardia infection for the past 50 years. Other antibiotic drugs were also used in Nocardiosis these years, like aminoglycosides, tetracyclines, amoxicillin, carbapenems, fluoroquinolones, rifampicin, oxazolidinones, benzothiazinones [11]. Recent reaches showed that fluoroquinolones had a high resistance, about 50%, but if it is active, fluoroquinolones is a very good choice because of its high oral bioavailability, good long-term tolerance and their tissue-penetrating characteristics [4].

Nocardia infection is difficult to diagnosis due to its not special clinical manifestation. This case reminds us that Nocardiacan involve such

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an uncommon site, and may occur in a patient had not so strong immunosuppression. In future, we should take more attention to the diagnosis and differential diagnosis of Nocardia infection though it is a rare disease.

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Disclosure of conflict of interest

None.

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