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***Key Words:**

AIDS; *Penicilliummar Neffe*; Cytomegalovirus; syphilis.

Case report: AIDS Coexisting with *Penicilliummar Neffe* and Cytomegalovirus Infection in Patient Who was Negative for Syphilis

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Abstract

Background To determine whether AIDS patients with low immunity are combined with opportunistic infection.

Methods The blood of the patient was used for bacterial fungi to observe the growth and morphology of the colonies and observe the characteristics under the microscope. Both serology and PCR methods were used to determine the test patients for co-infection.

Results The patient's blood culture was biphasic fungi, with yeast phase on 37°C Sand Fort's medium, 25°C penicillin growth and rose pigment production, and "brush branches" under the microscope. Cytomegalovirus-IgM antibody positive (+), cytomegalovirus-DNA fluorescence qualitative (PCR method): positive.

Conclusion AIDS patients coexisting with *penicilliummar neffe* and cytomegalovirus infection. The combined detection of multiple methods is conducive to the detection and treatment of early opportunistic infection in AIDS patients.

Introduction

AIDS is acquired immune deficiency syndrome (AIDS), is an infectious disease that seriously endangers human health, caused by human immune deficiency virus (HIV), HIV infection leads to human immune function deficiency, easy to combine a series of clinical syndromes such as opportunistic infection and tumor[1]. According to the study of Beijing Ditan Hospital, the most common opportunistic infections in Chinese AIDS patients are *Mycobacterium tuberculosis* (32.5%), followed by candidiasis (29.3%), pulmonary spore pneumonia (22.4%), cytomegalovirus infection (21.7%), other fungal infections (16.2%), *Mycobacterium tuberculosis complex (MAC)* (11.3%), *cryptococcus* (8%), multifocal leukoencephalopathy (PML) (4.4%), cerebral arch (3.5%), and *Marnicei* (1.4%)[2], The early symptoms of the above-mentioned opportunistic infections are similar, and clinical diagnosis is difficult. Although most cases are initially treated based on clinical symptoms, laboratory tests and imaging characteristics, the diagnosis is difficult, and some cases may be delayed. Current reports about AIDS patients with a variety of opportunistic infection is rare, AIDS with the case of *penicilliummar neffe* and cytomegalovirus infection reported as follows, which is hope to call the attention of clinicians, for such patients adopt a variety of methods combined detection helps AIDS patients early opportunistic infection discovery and treatment.

Case presentation

Patient, male, 23 years old, he was admitted to hospital due to "abdominal

pain for more than 1 month, accompanied by bloody stool and fever for 10 days". With a preliminary diagnosis of "Fever to be investigated" and "Small bowel and colon ulcers". Physical examination: clear mind, poor spirit, acute disease appearance. There were plenty of white spots in the oral mucosa, no yellow stains in the skin sclera, no rash hemorrhagic spots, and no swelling of superficial lymph nodes. The throat is not red, the tonsils are not large. Respiratory sounds in both lungs were clear, dry and wet rales were not heard, rhythm was consistent, and pathological murmurs were not heard in each valve area. The abdomen was flat and soft, the whole abdomen was light and tender, especially the left lower abdomen, there was no rebound pain, the liver and spleen were not reached under the ribs, Murphy sign (-), there was no tapping in the liver area and both kidney areas, there was mobility dullness (-), and there was no edema in both lower limbs. Nervous system: soft neck without resistance, no abnormal memory, calculation and orientation, pathological signs (-). Imaging examination: Capsule endoscopy of Chinese People's Liberation Army 181 Hospital showed multiple ulcers and bleeding in the whole small intestine and large intestine. Lung CT, lobular pneumonia, interlobular septal thickening, possible interstitial edema. After admission, the patient underwent blood routine, biochemistry, lymphocyte subsets, sputum for acidobacter and fungal spores, sputum culture bacteria, tuberculosis bacteria and fungi, throat swab for fungal spores, sputum and blood culture, pneumocystis carinii, influenza virus, toxoplasma gondii, rubella virus, herpes simplex virus, cytomegalovirus IgG and IgM and other related etiological tests.

Laboratory findings

Laboratory results showed that hemoglobin 96 g/L, red blood cells $3.39 \times 10^{12}/L$, WBC $5.58 \times 10^9/L$, including 76.1% neutrophils, 14% lymphocytes, and a platelet count of $86 \times 10^9/L$. Biochemical: Total protein 63.6 g/L, albumin 21 g/L, globulin 42.6 g/L, aminaminase 31 U/L, aminase 98 U/L, alkaline phosphatase 149 U/L, lactate dehydrogenase 521 U/L, creatinine 62.9 $\mu\text{mol}/L$, uric acid 3.01 mmol/L , cholinesterase 2982 U/L. Procalcitonin 27.04 ng/mL, tumor markers: AFP 0.6 $\mu\text{g}/L$, CEA 0.6 $\mu\text{g}/L$, Ca125 68.6 U/ml (elevated), Ca19-9 3.2 U/ml, Ca15-3 20.2 U/ml, total PSA 0.44 $\mu\text{g}/L$, cytokeratin 19 3.5 ng/mL, Ca72-4 1.7 U/ml. Peripheral blood lymphocyte subset: CD3+(85.8%), CD3+4+(4.2%), CD3+8+(73.50%), CD16+CD56+(4%), CD19+(6%). Blood cell morphology analysis results: lymphocyte classification, 3% monocyte classification, 1%, neutrophilic lymphocytes 14%, neuter granulocytes, 65%, smear, neutrophils, granulocytes cytoplasm visible toxicity, increased proportion of rod granulocytes, occasionally seen lymphocytes, mature red blood cells mild size, scattered platelets, no other special abnormal cells and parasites. Urinary routine showed no significant abnormalities.

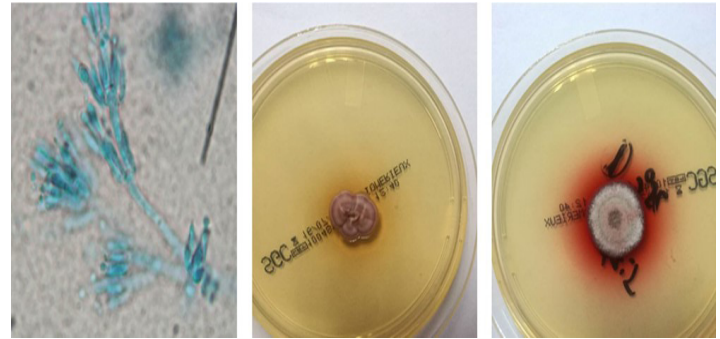


Figure 1: Microscopy and culture characteristics of *Penicillium marniffei*. A: After positive blood culture smear, the microscope, with A typical "broom branch" (lactic acid phenol cotton blue staining, X400); B: 37°C culture of 7d yeast phase colony morphology, the surface showed the brain gyrus or radial groove pattern, no pigment production; C: 25°C for 7d colony morphology, the surface colony gradually permeated the whole plate.

Results of throat swab bacteria and fungi culture: normal microflora, no fungal culture. Fungal G test: 677.80 pg/ml, TB bacterium antibody: negative. Cytomegalovirus-IgM antibody was positive (+), cytomegalovirus-IgG antibody was positive (+), and rubella virus-IgG antibody was positive (+). Cytomegalovirus-DNA fluorescence is qualitative (PCR method): positive. The patient was tested for hepatitis B, hepatitis C, HIV, syphilis and tuberculosis, and the results were only HIV-positive, the other results were negative, high suspicion of AIDS, reported to Hangzhou Center for Disease Control for testing, the results showed positive HIV western blot test. Blood culture results: fungal hyphae, further fungal culture, in 37°C blood medium colony surface gyrus or radial groove, no pigment, turn 25°C medium as the colony surface villus, the surrounding medium into red wine color, smear after the microscope visible branch separated mycelium, with a typical "broom branch", while 37°C medium as yeast, temperature bipolar bacteria, can be identified as penicillium according to the colony characteristics (Fig.1). The diagnosis is based on clinical presentation and laboratory findings was: AIDS with penicillium and cytomegalovirus infection.

Discussion

In 1988, *Penicillium marniffei* (PM) infection was first detected in the United States[3], In 2000, Deng Z first reported the first case of AIDS infection with PM in China[4]. In recent years, there have been many cases of AIDS combined with PM infection in China. With the incidence rate of AIDS increasing year by year, PM has become a common opportunistic infection of AIDS. Zhejiang province is located in the south of China, the temperature and humidity are high, suitable for the growth of *Penicillium marniffei*. So the AIDS populations should be paid more attention by the doctor [5]. According to the literature, *Penicillium marniffei* is a member of the genus, *Biverticillium* subgenus, is the only temperature bipolar bacterium, which is prevalent in the

atmosphere, is a regional highly pathogenic opportunistic fungal pathogen, which can cause disseminated marnafei penicillin disease. Marniefelosis occurs in people with low immunity and immunosuppressants, the vast majority of AIDS patients. Penicillium marnifei can be through the respiratory tract, digestive tract and skin infection, into the human body, caused by lesions mainly confined in the lungs and skin, when patients with low immunity, the bacteria into the blood through blood and through the network endothelial system spread to the whole body viscera, lead to skin and subcutaneous tissue infection and systemic infection of multiple organs[6]. Skin is the most prominent feature of the upper trunk and facial "target sample skin lesions", penicillium in addition to characteristic skin lesions, other clinical manifestations lack of specificity, so it is easy to lead to misdiagnosis, cause treatment delay, no effective antifungal treatment, disease can progress rapidly, eventually died of multiple organ failure[7]. Therefore, we should improve the understanding of AIDS with Marni penicillin. For AIDS patients with characteristic skin lesions, we should be highly suspected, and conduct microscopic examination and culture, so as to reduce the occurrence of missed diagnosis and misdiagnosis. In this case, the patient developed leukoplak oral mucosa. No characteristic skin lesions appeared, and the patient was determined to be Penicillium marnifei after blood culture. After definite diagnosis, the patient was treated with amphotericin B and itraconazole, and the patient's body temperature decreased significantly.

The cytomegalovirus (CMV) is a class of viruses that are ubiquitous in nature but are strictly species-specific. Human CMV infection is widespread and is the sole host of human cytomegalovirus (human cytomegalovirus, HCMV). Cytomegalovirus belongs to the herpesvirus family, DNA viruses, can be infected through the placenta, contact, injection, blood transfusion, respiration, fire organ transplantation and other ways. Once CMV infection occurs, often lifelong with poison, immune function is normal, infection is often asymptomatic, the virus continues to latent in the respiratory tract, genital tract and other parts, once the chance immunity drops or invasive treatment, the virus will invade the blood system, spread to the whole body, causing viremia and other symptoms[8]. CMV infection patients often have fever, headache, general discomfort and several organs of the grenade performance, common gastroenteritis, pneumonia, retinitis, can also cause encephalitis, hepatitis, pancreatitis fire adrenal necrosis. CMV infection most frequently involved the retina in AIDS patients, with an incidence of 20%. CMV retinitis is a late complication in AIDS patients, mostly occurring in CD4+Patients with T lymphocytes <50 / uL, most of whom have already had other opportunistic infections, so CMV retinitis is often referred to as the landmark disease of

AIDS. Because CMV retinitis without timely and effective treatment will lead to permanent blindness, early diagnosis is very important[9]. Cytomegalovirus is a cofactor promoting AIDS progression, and CMV and HIV are very closely related to HIV infection. First, they have common points in terms of susceptibility factors, and the CMV infection rate is higher in the HIV infection rate than in the general population. Second: HIV infected with active CMV infection with impaired immune function, the course of the disease is significantly accelerated, CMV is considered to be an important cofactor of HIV pathogenesis[10]. This case in the process of blood culture in the patients took the serum virology test, the results found that cytomegalovirus antibody IgM positive, conventional detection of cytomegalovirus antibody at the same time, the sensitivity, higher specificity of PCR detection of cytomegalovirus DNA, can more accurately reflect the actual situation of cytomegalovirus infection in AIDS patients. With the early detection of CMV infection and early antiviral treatment, the case fatality rate decreased, but the mortality rate of AIDS and viral pneumonia was still high, and if treatment was started after respiratory failure appeared, the case fatality rate was significantly increased. In short, CMV pneumonia has severe disease, rapid development and high mortality rate, and the prognosis is related to early diagnosis, early treatment, detection of AIDS and other immunocompromised patients, early diagnosis and early treatment.

In conclusion, AIDS patients are prone to opportunistic infections due to low immunity, but both fungal and viral infections are rare, so clinicians should pay attention to them. At the same time, they should strengthen the culture and identification of bacteria and fungi in patients positive for HIV antibody in the laboratory, and should not neglect the detection of related viruses.

Ethics statement: The studies involving human participants were reviewed and approved by Ethics Committee of Zhejiang Provincial People's Hospital. The patients/ participants provided their written informed consent to participate in this study.

Author Contributions: DC and YG wrote the manuscript and collected the data; FX and ZQ discussed and reviewed the manuscript, ZS and WH designed the manuscript analyzed the data; all authors read and approved the final manuscript.

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