

Penicillium marneffe: The pathogen at our doorstep

Sir,

Penicillium marneffe is emerging as an important opportunistic pathogen in HIV seropositive patients from South East Asia.^[1,2] *Penicillium marneffe* in India has been reported from Manipur, which shares borders with Myanmar,^[3] and a case has also been reported from New Delhi,^[4] but the patient came from Manipur.

We are reporting a case of *Penicillium marneffe* infection from Mumbai, which is a non-endemic area. A 46-year-old farmer presented with fever, loose motions, loss of appetite, weight loss, and cervical lymphadenopathy. The patient was known to be HIV seropositive with a CD₄ count of 60 cells / microliter. Giemsa-stained smears of lymph node aspirate revealed intracellular as well as extracellular round-to-oval yeast cells [Figure 1]. Initial diagnosis was either histoplasmosis or penicilliosis. A portion of the biopsy was cultured on a set of two tubes of Sabouraud's Dextrose agar (SDA) and incubated at 25 and 37°C. Cultures at 25°C on SDA showed mycelial growth with soluble red pigment [Figure 2], whereas, glabrous colonies were seen on SDA at 37°C. Lacto-phenol cotton blue (LPCB) preparation from a colony grown on SDA at 25°C showed metulae bearing conidia. (X 1000) Gram-stained smear showed yeast cells. Subcultures from mycelial colonies on Brain Heart Infusion agar were prepared, which were incubated at 37°C, and showed mycelial cell to yeast cell conversion. Gram-stained smears from colonies showed yeast cells with transverse septa, characteristic of *Penicillium marneffe*, which was evident on Gomori's methenamine silver nitrate

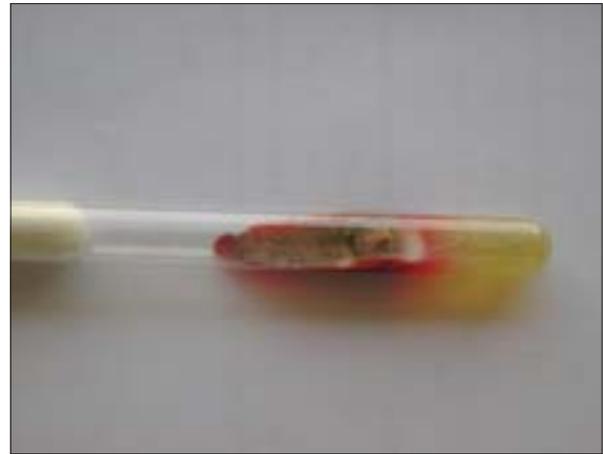


Figure 1: Mycelial colony of *Penicillium marneffe* on SDA incubated at 25°C with diffuse red pigment



Figure 2: LPCB preparation from colony grown on SDA at 25°C showing penicillium, with metulae and conidia. (X 1000)

staining. The patient responded to standard antifungal treatment (Intravenous amphotericin B followed by oral fluconazole).

Penicillium marneffe is a dimorphic fungus (i.e., it exists in hyphae and yeast forms), first isolated from bamboo rats in Vietnam, in 1956. The first naturally acquired human infection was also in a Vietnamese, in a patient with Hodgkin's disease.^[5] The organism can be isolated from lungs, spleen, liver, and lymph nodes in more than 90% of the *Rhizomys* species of bamboo rats.^[5] Although exposure to soil has been suggested as a risk factor, it remains unclear, whether rats are involved in transmitting the organism or whether both humans and rats are infected from a common, but still unidentified source.^[5,6] According to some evidences, it directly infects host species, bamboo rats, and humans.^[5] Little is known about the etiology and pathogenesis, although bamboo rats are known to be asymptomatic carriers (which are present in endemic

areas), it is unclear whether they are an important reservoir for human infection or only a sentinel animal that is susceptible to infection from an environmental source. Human infections have been reported from traumatic implantation, inhalation of spores from soil, or possibly from a specific host plant.^[5] *Penicillium marnettei* has been isolated from bamboo rat furrows and the current consensus would favor soil as the most probable reservoir, with transmission to humans via the respiratory root. Therefore, there seems to be no role for the rats on the natural occurrence of the disease. Similar to other pathogenic fungi, the conidia are inhaled and internalized by alveolar macrophages and transported to the reticuloendothelial system. The organisms then proliferate as soon as host immunodeficiency takes place, leading to systemic infection.^[5] However, this remains to be proven and for now the natural habitat of the fungus and an explanation of its geographic restriction remains unknown.

As we have isolated the pathogen from a non-endemic region; the clinicians should be aware of the fact that a high index of suspicion is required to diagnose these relatively uncommon infections in non-endemic areas.

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