Arthrographis kalaiae onychomyositis: isolation and implications for diagnosis and treatment.

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Introduction

Onychomyositis is a prevalent condition affecting approximately 10% of the global population, caused by various fungal species, including dermatophytes, yeasts, and non-dermatophyte moulds like Arthrographis kalaiae.

However, there is a notable scarcity of literature on Arthrographis-induced onychomyositis. A. kalaiae is a hyaline saprophytic (2) ascomycete anamorphic fungus, seldom isolated in onychomyositis. It has primarily been associated with corns, nails, and soft tissue infections, but its pathogenicity has been underestimated due to its weak pathogenic potential. A. kalaiae thrives within a wide temperature range (15–45 °C) and excels at a pH range of 1.8-4.2.

It has virulence factors like haemolytic and cytotoxic secretions, as demonstrated in mouse models. Its history dates back to 1938 when it was first reported as the causative agent of a nail lesion and classified as A. langonarri in France (4). Subsequently, in 1963, it was isolated from a lung tissue taken in India. Initially described as Oldodendron kalaiae, unaware of prior research (4). In 1976, it was officially recognized as Oldodendron kalaiae kalaiae, implicated in severe mycotic keratitis. Sigier and Carmichael later reclassified its classification as A. kalaiae (4). Clinical cases of invasive infections involving A. kalaiae have risen recently, although it is often considered a contaminant when identified. It has been linked to various human infections, including pulmonary infections (7), mycotic keratitis (3), onychomyositis (5), refractory knee joint infections (1), simian's in Cystic Fibrosis patients, and ophthalmic issues. Infection prevention primarily relies on avoiding inoculation and restoring host immunity, as there is currently no vaccine available.

Aims: This work aims to document and emphasise the isolation of this rarely encountered fungus.

Objective: To foster awareness, spark discussion and enhance scientific knowledge.

This work's clinical significance goes beyond addressing concerns related to targeted therapy and antimicrobial resistance. It also encompasses several other crucial aspects like other infections, patient outcomes, reduced healthcare cost, clinical guidelines, public health, and research and drug development.

Methodology

Materials:
Sterile forceps and scalpels, Sabouraud dextrose agar supplemented with chloramphenicol, Sabouraud dextrose agar with acetidone, 10% potassium hydroxide, fluorescence light microscope, incubator set to 30°C, Calcofluor white, Lactofuchsins(6) and Brueker Maldi tof.

Samples:
Routine samples from patients with suspected onychomyositis.

Method:
Microscopy: The nail fragments/clippings from persons with suspected onychomyositis were transferred into a sterile petri dish. A small portion of the nail sample was crushed and transferred into a test tube with a few drops of 10% potassium hydroxide (KOH) solution for 30 minutes. This was then mounted on a glass slide with a drop of Calcofluor white. The slide was then examined for the presence of fungal hyphae/elaments and spores(6).

Culture: Macerated nail fragments were also cultured on Sabouraud agar plate supplemented with chloramphenicol to inhibit bacterial growth and another with acetidone. These plates were incubated at 35-37°C for 8 weeks with weekly examination.

Identification: The grown colonies were examined for their macroscopic and microscopic characteristics. A. kalaiae, typically forms white to cream-coloured colonies usually fissuring into the agar (1) with distinctive corneophores and conidia. The Maldi-tof technique employed during this study (which was performed according to Manufacturer instructions) sufficiently confirmed the identification of A. kalaiae with log score values of ≥2.0.

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References


