DIRECT MICROSCOPY AND FACTORS ASSOCIATED WITH CULTURE-CONFIRMED OTOMYCOSIS: BASELINE EVIDENCE FOR FUTURE AI-ASSISTED CLINICAL PREDICTION

Habeeb Mohamed Fathima Seeha[1], Nagananthakumaran Abinaya[1], Senthilnathan Reluxzy[1], Navaratnarajah Indranath[2], Thevaki Gnanakarunyan[1]*

[1]Department of Medical Laboratory Sciences, University of Jaffna, Sri Lanka

[2]ENT Unit, Teaching Hospital Jaffna, Sri Lanka

*Corresponding author: thevakijg@univ.jfn.ac.lk

Abstract

Otomycosis is a prevalent fungal infection of the external auditory canal in tropical regions, yet timely diagnosis remains challenging due to non-specific clinical manifestations and the reliance on fungal culture, which requires prolonged processing time. This study aimed to investigate direct microscopy findings, fungal pathogen distribution, and factors associated with culture-confirmed otomycosis, while generating baseline evidence for future AI-assisted clinical prediction approaches. An institutional based descriptive and analytical cross-sectional study was conducted at the ENT Clinic, Teaching Hospital Jaffna, Sri Lanka, from February to April 2026. A total of 108ear swab specimens from 101 patients with suspected otomycosis were examined using direct wet mount microscopy, gram staining, and fungal culture with species identification. Demographic, clinical, behavioral, and environmental data were collected using a structured questionnaire and analyzed using IBM SPSS statistics, with $p<0.05$ considered significant. Fungal growth was observed in 85 (78.7%) specimens. *Aspergillus* species predominated (52;61.2%), followed by *Candida* species (15;17.6%), mixed fungal growth (13;15.3%), dematiaceous fungi (3;3.5%), and unclassified isolates (2;2.4%). Considering all*Candida* isolates including from mixed fungal growth, non-*albicans Candida* species accounted for66.7% (14/21). Wet mount detected fungal elements in 80 of 85 culture-positive specimens (sensitivity 94.1%, specificity 100%), and gram stain in 84 specimens (sensitivity 98.8%, specificity 100%). Both showed highly significant associations with culture positivity ($p<0.001$). Habitual ear cleaning ($p=0.016$) and hearing impairment ($p=0.034$) were significantly associated with culture confirmed otomycosis. These findings highlight the diagnostic value of rapid microscopy and provide important insight into the epidemiological and clinical factors of otomycosis. By integrating microscopy findings with patient-levelassociated risk factors, this study establishes baseline evidence that may inform future AI-assisted clinical prediction systems aimed at enabling earlier recognition and management of otomycosis, particularly in resource-limited healthcare settings.

Keywords: Artificial Intelligence, Associated factors, Direct Microscopy, Fungal Culture, Otomycosis