

The Clinical Relevance of Genotypic Data in Blastomycosis Infections



Klaire Laux
University of Wisconsin -
Oshkosh

Klaire L. Laux¹, Jennifer L. Anderson¹, Holly Frost², Jennifer K. Meece¹

¹*Integrated Research and Development Laboratory*, ²*Marshfield Clinic Department of Pediatrics - Minocqua, WI*

Research area: Clinical and Laboratory Research

Background: Blastomycosis is a fungal infection hyper-endemic in Wisconsin. Recently, *Blastomyces dermatitidis*, the etiological agent of blastomycosis, was shown to include a cryptic species, *Blastomyces gilchristii*. The purpose of this study was to explore the differences in demographics, clinical features, and clinician practices in *Blastomyces dermatitidis* and *Blastomyces gilchristii* infections.

Methods: Cases of blastomycosis from 2009-2017, for which clinical data and a fungal isolate were available were selected for analysis. The species of each fungal isolate was determined by Sanger sequencing. Patient demographics, clinical features, and treatment and monitoring practices were abstracted from each patient record. Differences were analyzed with t-tests and chi-squared tests.

Results: We identified 98 cases of blastomycosis for the study. Of those, species information was determined for 83 of which 27 were *B. dermatitidis* and 56 were *B. gilchristii*. The mean age of patients was significantly different for those infected with each species ($p < 0.0001$). Of the 98 cases, 60% were hospitalized with an average stay of 13.9 days. Only 70% of *B. dermatitidis* were accompanied by respiratory symptoms and/or abnormal lung exam as opposed to 93% of *B. gilchristii* infections. Despite strongly recommended guidelines from the Infectious Diseases Society of America (IDSA), in only 54% of cases were anti-fungal concentration levels monitored by physicians. Within the cases tested, 30% of patients showed at least one value at toxic or sub-therapeutic doses. In 97% of cases, physicians made use of radiographic imaging and in 50% of cases physicians made use of urine antigen testing to monitor response to anti-fungal therapy.

Conclusions: *Blastomyces dermatitidis* and *Blastomyces gilchristii* display clinically relevant differences in terms of patient demographics and clinical symptoms. Exploration in clinician practices highlighted the importance of evaluating anti-fungal serum concentration. Future research will focus on exploration into diagnostic differences and genetic variability in relation to pulmonary-only or disseminated clinical presentation.