Original Article

Immunoproteomic analysis of antibody response to cell wall-associated proteins of Candida tropicalis

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Abstract

Aims: This study was conducted to identify antigenic proteins of Candida tropicalis that are targeted by the host immune system.

Methods and Results: An immunoproteomic approach was used to discover antigens from cell wall of C. tropicalis that were recognized by sera from experimentally infected mice. This resulted in the identification of twelve distinct proteins, of which ten have been previously reported as antigens of Candida albicans. For the remaining two proteins, Idh2p has been described as an antigen of Candida parapsilosis, whereas Kgd2p is revealed for the first time as an antigenic protein for Candida species. These two antigens were expressed as recombinant proteins in Escherichia coli and were shown to be specifically recognized by sera from infected host on Western blot.

Conclusions: The present work investigated immunoproteome of C. tropicalis and identified several biomarker candidate antigens, with Kgd2p as a novel immunogenic protein that could be associated with pathogenesis of C. tropicalis.

Significance and Impact of the Study: Findings from this study help to improve current understanding on host response to C. tropicalis infection and provide new insights into immune-pathogenesis of C. tropicalis. Besides, the immunogenic proteins could be considered as targets for the development of immunodiagnostic assay and/or vaccine.

Introduction

Candida species are commensal fungi in healthy individuals but are also opportunistic pathogens that can cause infection when the host immune system is weakened. Infection caused by Candida spp. can take on several forms, which vary from simple mucosal colonization to life-threatening systemic infection. The latter form is of particular importance as it is associated with high mortality and morbidity rate and substantial healthcare burden (Ortega et al. 2011). In United States, candidiasis was ranked as the fourth nosocomial bloodstream infection (Wisplinghoff et al. 2004). Importantly, nosocomial infections caused by Candida spp. have continued to increase over the past few decades (Concia et al. 2009).

Candida albicans is the main species isolated from clinical specimens and is the predominant causative agent of all type of candidiasis. However, a shift in the epidemiology trend has been observed in recent years as other Candida spp. are increasingly being isolated (Pereira et al. 2010; Rodloff et al. 2011). Remarkably, increase in the incidence of Candida tropicalis has been reported in several countries worldwide (Nucci and Colombo 2007; Yang et al. 2013). Similarly, C. tropicalis has shown significant increase in the frequency of isolation from local clinical samples in Malaysia (Hamid et al. 2007).