P386 - Action of methylene blue photodynamic therapy on *Cryptococcus* spp. resistant to conventional antifungals

Mario Leon Silva-Vergara[1], Felipe Nunes de Oliveira[1], Luciano Bachmann[2], Thatiane Bragine-Ferreira[1], Leonardo Eurípedes Andrade-Siva[1], Renato Ventresqui[2], Delio José Mora[1]. 1 Infectious Diseases Unit, Triângulo Mineiro Federal University, Uberaba, Minas Gerais. 2 Faculdade de Filosofia, Ciências e Letras da Universidade de São Paulo, Ribeirão Preto, São Paulo. Email: marioleon.dip@mednet.com.br

Introduction

Recently, the photodynamic therapy (PDT) has been researched as an alternative tool to eradicate bacteria, protozoa, viruses, and fungal infections. It uses a combination of a photosensitive substance activated by a light source in the presence of oxygen. The resulting reaction induces cell death due to the production of toxic oxygen species, such as singlet oxygen and/or free radicals. This study aimed to evaluate the effectiveness of methylene blue (MB) and light emitting diode against *Cryptococcus neoformans* and *C. gattii* resistant to amphotericin B and fluconazole.

Methods

Cryptococcus strains

***Cryptococcus* spp. (n=17)**

- ***C. neoformans* (n=15)**
  - Environmental (6)
  - Clinical (9)
- ***C. gattii* (n=2)**
  - Environmental (2)

Photodynamic therapy

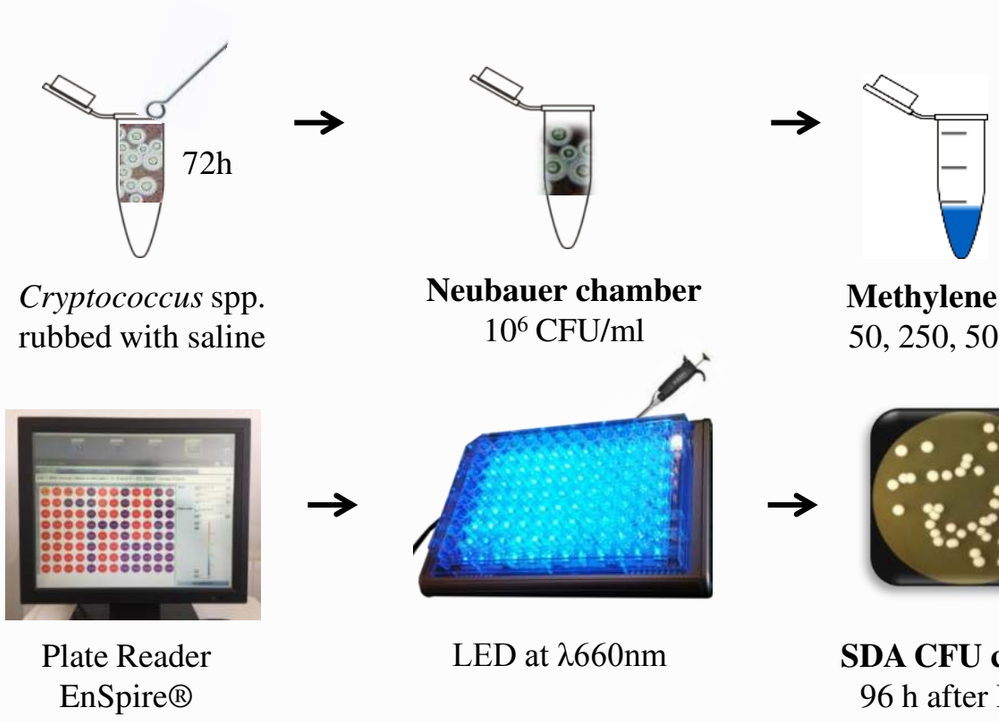

Figure 1: Protocol of photodynamic therapy in *Cryptococcus* spp. resistant to antifungals. Light Emitting Diode (LED) with fluence of 5.6, 11.2, 16.9 J/cm^2 without methylene blue. SDA - Sabouraud Dextrose Agar..

Results

- ✓ The LED or MB alone did not reduce cryptococcal viability.
- ✓ Clinical and environmental isolates of *C. neoformans* were susceptible to PDT ($p > 0.05$).
- ✓ MB 250µM associated to 16.9 J/cm^2 reduced the fungal viability regardless the species or origin ($p > 0.05$).
- ✓ Strains of *C. neoformans* susceptible to AMB reduced in 3.1 $\log_{10}$ CFU count ($p \leq 0.05$).
- ✓ Strains of *C. gattii* resistant to FLZ exhibited more tolerance to PDT ($p \leq 0.05$).

Conclusion

Photodynamic activity of MB associated to LED decreasing the cryptococcal viability of both, clinical and environmental *Cryptococcus* spp. isolates. *In vivo* tests could be performed in order to verify the potential therapeutic efficacy of this combination.

Financial support: FAPEMIG Fundação de Amparo à Pesquisa do Estado de Minas Gerais