"To evaluate the minimal inhibitory concentration (MIC) of clioquinol, cliclopyroxolamine, terbinafine, 8-hydroxyquinoline and dexamethasone, against dermatophytic strains pathogenic to humans and difficult to treat."

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Introduction

Dermatophytoses or tineas are infections caused by dermatophytes, keratinophilic fungi that can infect the skin, hair and nails (1). The worldwide distribution of these infections and their causative agents vary according to geographic region and several factors, such as: population characteristics, lifestyle, migration of people, cultural practices and socioeconomic conditions, incidence of peculiar comorbidities and drug therapy (2). The knowledge about dermatophytes and their peculiarities are of fundamental importance in view of the numerous reports of resistance to current antifungal therapy (3).

Experimental section

Antifungal susceptibility was evaluated with five isolates (ATCC, TRU2, TRU 45, TRU 47 and TRU 51) of Trichophyton rubrum and five isolates (TME ATTC, TME 2, TME 32, TME 40 and TME 60) of Trichophyton mentagrophytes against cyclopyroxolamine (16 µg/mL), clioquinol (16 µg/mL), 8-hydroxyquinoline (32 µg/mL), terbinafine (0.5 µg/mL), and dexamethasone (2,000 µg/mL). This evaluation was carried out following what was proposed by CLSI, through the document M38-A2 for filamentous fungi.

Results and Discussion

The Minimum Inhibitory Concentration (MIC) achieved for Ciclopyroxolamine was 1 µg / mL against the TRU2, TRU45, TR47, TME32, TME40 and TME60 strains. Regarding Clioquinol, the MIC was 0.25 µg / mL for TRU45, while the MIC for 8-hydroxyquinoline was 0.25 µg / ml for TRU45, while the MIC for Terbinafine was 0.0078125 µg / mL and compared to dexamethasone, no MIC was obtained, as expected. This study aimed to evaluate the minimal inhibitory concentration (MIC) of clioquinol, cyclopyroxolamine, terbinafine, 8-hydroxyquinoline and dexamethasone, against dermatophytic strains pathogenic to humans and difficult to treat.

Conclusions

The drugs tested (clioquinol, 8-hydroxyquinoline, cyclopyroxolamine, terbinafine) are very promising, as they demonstrated concentration-dependent antifungal action against the strains of *Trichophyton rubrum* and *Trichophyton mentagrophytes* tested. And as expected, dexamethasone, as it is a corticosteroid, did not show any antifungal activity.

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References

1. Silva C.S., Neufeld P.M., Gouvêa E.H., Abreu P.A.. Etiologia e epidemiologia da tinea capitis: relato de série de casos e revisão da literatura. Brazilian Journal of Clinical Analyses - RBAC. 2019;51(1):9-16 DOI: 10.21877/2448-3877.201800781

2. Dogra, S., Dipika S. and Rudramurthy, S.M.. "Antifungal drug susceptibility testing of dermatophytes: Laboratory findings to clinical implications." *Indian dermatology online journal* 10.3 (2019): 225.

3. Lopes, A.I., Tavaria F.K., and Pintado, M.P.. "Conventional and natural compounds for the treatment of dermatophytosis." Medical mycology. (2019) DOI:10.1093/mmy/myz116

4. CLSI 2008. Clinical and Laboratory Standards Institute. Reference Method for Broth Dilution Antifungal Susceptibility Testing of Yeasts; Approved Standard –Third Edition. CLSI Document M38-A2. Clinical Laboratory Standards Institute, Wayne, PA, USA, 2008.