Comparison of *T. rubrum* specific PCR and pan-dermatophyte PCR with conventional methods in patients with suspected onychomycosis

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Introduction

The diagnosis of onychomycosis is still in most countries based on the demonstration of fungal elements in nail specimens by microscopy and culturing and identification of the causative species. This is time-consuming, requires trained personnel and has suboptimal sensitivity. The aim of this study was to evaluate the *T. rubrum* specific PCR and pan-dermatophyte PCR, which were run separately, in comparison with conventional diagnostic methods for nail specimens from patients with suspected onychomycosis and describe the epidemiology of onychomycosis in Serbian citizens.

Materials and Methods

One hundred ninety five patients with nail changes highly suggestive to onychomycosis have entered into this cross-sectional study. We excluded patients who used topical or systemic antifungal drugs within the previous 2 and 4 weeks, respectively, and also patients who did not consent to have a sample clipped from their nail. Basic demographic data were collected for each patient, site of infection (fingernails or toenails) and clinical type of onychomycosis. All nail samples were subjected to potassium hydroxide (KOH) and Blankophor microscopy, PCR and culture.

Results

KOH, Blankophor, culture and PCR were positive in 67/195 (34.4%), 84/195 (43.1%), 56/195 (28.7%) and 106/195 (54.4%) specimens, respectively. Dermatophytes were cultured in 51/195 (26.1%) with predominance of *T. rubrum* isolated in 44/195 (22.6%) nail samples. PCR identified *T. rubrum* in 86/195 (44.1%), *T. interdigitale* in 7/195 (3.6%), and 13 samples were pan-dermatophyte positive (6.7%). The number of dermatophyte positive samples increased by 6.7% by using of PCR assay. KOH, BP, culture and PCR were the sole positive test in 1/195 (0.5), 2/195 (1.1%), 2/195 (1.1) and 17/195 (8.7%), respectively.

Table. Positivity rate of individual tests and combination hereof for the detection of fungi from patients with suspected onychomycosis

Method	Positivity rate % (no./total)
Culture	28.7 (56/195)
KOH	34.4 (67/195)
BP	43.1 (84/195)
KOH and culture*	46.7 (91/195)
BP and culture	47.7 (93/195)
KOH and BP	48.7 (95/195)
KOH, BP, culture	52.3 (102/195)
PCR	54.4 (106/195)
Culture and PCR	57.9 (113/195)
KOH and PCR	58.5 (114/195)
BP and PCR	59.5 (116/195)
KOH, BP, PCR	60.0 (117/195)
KOH, culture, PCR	60.0 (117/195)
BP, culture, PCR	60.5 (118/195)
KOH, BP, culture, PCR	61.0 (119/195)

KOH – potassium hydroxide; BP – Blankophore
*Most widely employed combination in routine practice

References

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Conclusions

PCR has high sensitivity in nail specimens and offers rapid and accurate species identification which can reduce the needed number of consultations and empirical usage of antimycotics in therapy of onychomycosis. The results of this study demonstrated the usefulness of pandermatophyte PCR and *T. rubrum* specific PCR in the rapid but reliable and precise diagnosis of onychomycosis.