

Session: EV010 Fungal infection & disease

Category: 6a. Fungal disease epidemiology & clinical trials

22 April 2017, 08:45 - 15:30
EV0131

Epidemiological study of onychomycoses in Athens, Greece: a five-year retrospective analysis

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Background: Onychomycosis is a common nail disorder caused by dermatophytes, yeasts or non-dermatophyte molds (NDM's). As other conditions may resemble onychomycosis and as the fungal infection requires a long-term systemic antifungal treatment, the accurate detection and identification of the causal agent is mandatory. The aim of this retrospective study is to determine the epidemiology of fungal species related to the onychomycoses in the area of Athens during the last five years.

Material/methods: The retrospective analysis (2011-2015) based on records of outpatients who visited the "Andreas Syggros" Hospital (Athens, Greece), a tertiary referral hospital of Dermatologic Diseases covering more than four million people of the Greek capital (almost half of the national population). Mycological nail investigation was performed by the Mycology Department in 12,134 patients (8,654 women and 3,480 men) with clinically suspected onychomycosis by conventional methods (direct microscopy and cultures on Sabouraud dextrose agar and Sabouraud dextrose agar with actidione).

Results: Positive results were found in 3,655 patients (2,247 women and 1,408 men), corresponding to 30% of the total. In women, 1,336 onychomycoses (59%) were localized in toenails and 911 (41%) in fingernails. In men, 1,116 onychomycoses (79%) were localized in toenails and 292 in fingernails (21%). Overall 2,286 patients (62%) were found positive by direct microscopy and culture, 139 (4%) were found microscopically negative/positive by culture, and 1,230 (34%) were found microscopically positive but without fungal growth in the culture mainly due to local or systemic administration of antifungal drugs. Details as far as the performance of the conventional methods are shown in the table.

Direct Microscopy/ Cultures	MALE			FEMALE		
	TOENAILS	FINGERNAILS	TOTAL	TOENAILS	FINGERNAILS	TOTAL
+/+	703	212	915	617	754	1371
-/+	32	15	47	60	32	92
+/NFF	381	65	446	659	125	784

The organisms most frequently diagnosed by direct microscopy and culture, were dermatophytes (1,171; 50%), followed by yeasts (1,033; 44%) and NDM's (128;6%). Most frequently yielded dermatophytes were *Trichophyton rubrum* (993;84 %) and *Trichophyton interdigitale* (170;14 %). *Candida albicans* (943; 91%) was the most common among yeasts. Regarding NDM's, *Scopulariopsis brevicaulis* (40;31,2%), *Acremonium strictum* (29;22,6%), *Aspergillus terreus* (15;11,7%) and *Fusarium* spp. (11;8,6%) were the most frequent isolated.

Conclusions: According to these findings, it seems that the range of the onychomycoses in Athens follows the global pattern of the anthropophilic dermatophyte *Trichophyton rubrum* in toenail infections in both genders. As for the fingernail infections in both genders the most frequent cause is the yeast *Candida albicans*. Mycological investigation is important in order to select the most appropriate treatment.