

Original article

Fungal infections in patients with nail psoriasis in Khuzestan province

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Abstract

Introduction and objective: Psoriasis is a chronic, recurrent, and common inflammatory skin disease, characterized by skin and nail involvements. Onychomycosis is a common disease of the nails. The relationship between psoriasis and onychomycosis is ambiguous. We studied this relationship in psoriasis patients with any nail involvement.

Materials and methods: The nail specimens were prepared by scraping and clippings from the patients with nail changes of psoriasis, which referred to the Department of Dermatology of Ahvaz Jundishapur University of Medical Sciences during 2008-2009. These samples were studied through smear preparing and culture.

Result: Totally, we studied 60 eligible cases (27 men and 33 women). The mean age was 32±8 years. The most common clinical form of psoriasis was psoriasis vulgaris (63.3%). Only one patient showed yeast in direct microscopy examination, whose culture was negative.

Conclusion: This study revealed no statistically significant association between nail psoriasis and fungal infection.

Keywords: Psoriasis, Onychomycosis, Fungus, Nail

Introduction

Onychomycosis is a common disease of the nail. The prevalence in population-based studies ranges from 2 to 11% [1]. Onychomycosis has been reported as gender and age-related, being more prevalent in males and increasing with age in both genders [2]. Increased incidence of

onychomycosis is associated with various conditions, such as peripheral arterial disease, immunosuppression, diabetes mellitus [2], traumatic and trophic nail changes [3], genetic factors, history of atopic disease, chronic disease, psoriasis and sports (swimming) [1].

The dermatophytes cause the great majority of onychomycosis. Among them *Trichophyton rubrum* is responsible for approximately 71% and *T. mentagrophytes*, for 20% of all tinea unguium cases. Yeasts are the source of approximately 5% of onychomycosis, the majority of which is caused by *Candida albicans*. The non-dermatophyte moulds account for approximately 4% of onychomycosis, with *Scopulariopsis brevicaulis* as the most frequently identified mould pathogen [3].

Psoriasis is one of the most frequent dermatoses affecting nails. Nail involvement is present in about 20~30% of patients with psoriasis vulgaris and in about 70% of patients suffering from arthropathic psoriasis. There is also evidence of isolated nail psoriasis occurrence with any skin lesions. Many psoriatic patients have nail changes such as subungual hyperkeratosis, pitting, yellow or white discoloration, onychorrhexis or thickening of the plates, which morphologically resemble onychomycosis [4], and its diagnosis relies on negative mycological tests [2]. The incidence of onychomycosis in psoriatic nail has not accurately been assessed, and literature data are very limited [4]. Therefore, the present study was undertaken to determine the frequency of fungal infection in psoriatic patients with nail involvement.

Materials and methods

A prospective clinical study was performed on the psoriatic patients with any nail involvement, who referred to the Department of Dermatology of Ahvaz Jundishapur University of Medical Sciences during 2008-2009. Initially, the questionnaire, designed for the current study, addressed patient demographic and disease information, was completed for each patient. Then, the subjects were re-examined by us to confirm accurate

diagnosis. Our diagnosis of psoriasis was based on clinical findings, and if necessary, being confirmed by histopathological studies. After recording the subjects, demographic information and clinical findings, we referred the candidate patients to the reference laboratory for nail sampling.

The nail specimens, prepared by scraping and clippings from the patients with nail changes of psoriasis. The carefully collected nail samples were divided into two parts. For the first part, 10% potassium hydroxide (KOH) aqueous solution was added on a clean glass slide for direct examination. The second part was used for culture examination in Sabouraud dextrose agar (Merck, Germany) and Sabouraud dextrose agar with cycloheximide and chloramphenicol (Merck, Germany) media. Cultures were routinely incubated in 25-30°C and examined weekly up to 2-3 weeks. The identification of each fungus was based on its characteristic colonies and microscopic morphology.

Results and discussion

Overall 60 psoriatic patients were examined for onychomycosis. Of all these patients, 27 (45%) were men and 33 (55%) were women. The mean age was 32±8, aged 5-62 years. The majority of the patients were in the third decade of life. The disease duration varied between two months and 21 years. The nail samples were collected from 27 (45%) finger nails, 9 (15%) toe nails and 24 (40%) both fingers and toe nails with psoriasis.

The most common clinical form of psoriasis was psoriasis vulgaris (38, 63.3%). Other clinical forms of psoriasis in descending order included in: plantar psoriasis (6, 10%), isolated nail psoriasis (18, 13.3%), localized pustular psoriasis (1, 1.7%), generalized pustular psoriasis (3, 5%), guttate psoriasis (1, 1.7%),

erythrodermic psoriasis (2, 3.3%) and inversus psoriasis (1, 1.7%). Of total 60 patients, direct microscopic examination revealed yeast in only one case, but cultures were positive not at all.

Onychomycosis is the most common disease of the nails and constitutes about a half of all nail abnormalities. Epidemiological data showed that about 2-8% of the population suffered from fungal infections of the nails, but probably some of these assessments could be underestimated [4]. The epidemiology of onychomycosis in Khuzestan province was studied by Yaghoobi and Hoghooghi Rad [5] in a period of 11 years (1987-1997). They examined 2,525 persons for onychomycosis. Women were affected more than men ($P < 0.01$). Of total 1085 positive nail cultures, 866 (79.8%) demonstrated *C. albicans*, 84 (7.7%) *Candida* species, 22 (2.02%) dermatophytes, and 113 (10.4%) moulds. Of the species causing nail dermatophytosis, *T. mentagrophytes* was the most common (40.9%) whereas of the species causing mould infections, *Aspergillus fumigatus* was the commonest (38%). They concluded that yeast species, especially *C. albicans*, might be the most common cause of onychomycosis in Khuzestan.

A more recent clinical study of nail changes in psoriasis patients by Yaghoobi *et al.* [6] in Ahvaz showed that among 500 psoriasis patients, 296 (59.2%) had nail changes. The most common clinical type of psoriasis was plaque type psoriasis (62.2%). The most common nail abnormalities, observed on both fingernails and toe nails, was onycholysis (22.6%). They concluded the frequency of nail involvement and changes in their patients is nearly similar to those reported in the textbook of dermatology and literature.

The dermatological literature on the relationship between psoriasis and onychomycosis is ambiguous. Certain

authors found no difference in the incidence of onychomycosis between those patients and patients with other skin disease. Based on the results, a hypothesis has been proposed claiming that the rapid growth of psoriatic nail decreases the opportunity of fungi to invade these nails, and thus limit the prevalence of onychomycosis [2].

Study of Ständer *et al.* [7] revealed that secondary colonization by yeast is more common in psoriatic nails than those in the general population. Gupta *et al.* [8] showed the odds of patients with psoriasis having onychomycosis was 56% greater than non psoriasis of the same age and sex. A possible explanation is that the abnormal capillary unit in psoriatic nails impairs the defense normally supplied by healthy hyponychium, predisposing the nail to fungal infection [2].

Our survey revealed that only one case of total patients was positive for direct microscopic examination, but its culture was negative. These findings were not consistent with other relevant studies mentioned above. It appears that increased growth rate of nails due to two causes including in underlying disease (psoriasis) and hot weather in Khuzestan province, contribute to throw the fungal elements away. We also believe that technical difficulties in collecting appropriate nail sample due to hardness of nail could be other factor in such negative results. On the other hand, errors in laboratory techniques could be considered as another cause in these results.

Conclusion

Our study revealed that there is no significant association between nail psoriasis and onychomycosis; hence, it appears nail changes in psoriatic patients are exclusively due to underlying psoriasis. However, to confirm this, comprehensive studies are necessary.

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