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Profile of onychomycosis in dermatology outpatient department at Sanglah General Hospital Denpasar, Bali-Indonesia periods 2016-2017

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ABSTRACT

Introduction: Onychomycosis is a fungal infection of the nails that causes discoloration, thickening, and separation from the nail bed. Onychomycosis is caused by various organisms, most often dermatophytes of the genus *Trichophyton*. Other organisms include *Candida,* which is more common in fingernail infections and patients with chronic mucocutaneous candidiasis. Nondermatophyte molds are a less common cause in the general population. This study aimed to identify sex, age, classification, fungal culture, treatment, and incident of secondary infection in onychomycosis at Dermatology Outpatient Department at Sanglah General Hospital Denpasar Periods January 2016 – December 2017.

Methods: Study design using descriptive retrospective model done by taking data from medical record in Dermatology Outpatient Department at Sanglah General Hospital Denpasar Periods 2016-2017.

Result: There were 268 patients in Dermatovenereology Outpatient Department at Sanglah General Hospital Denpasar, 29 (10,82%) of whom were diagnosed with onychomycosis in Periods 2016-2017. According to age group, the most cases occur in 26-65 year age groups. Females were more frequently affected than males. The most classification finding is distal and lateral subungual onychomycosis and the most commonly isolated fungi were yeasts from the *Candida species*. The most commonly given therapy is a combination therapy of systemic antifungal with topical. Fluconazole is the most common drug that uses orally and ciclopirox as topical agent.

Conclusions: Onychomycosis is one of the common fungal infection observed in patient attending dermatology outpatient department with the most classification finding is distal and lateral subungual onychomycosis. The most commonly isolated fungi were *Candida sp*.

Keywords: onychomycosis, fungal, nail

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INTRODUCTION

Onychomycosis occurs in 10% of the general population, it is caused by a variety of organisms, but most cases are caused by dermatophytes.[1] Onychomycosis is a global disease, with a variety in prevalence. In western countries reported prevalence ranges from 2-18% of the population, while the survey in tropical countries of Asia prevalence is 8.1%. In Indonesia, prevalence of studies has been conducted showing a range of 3.5% - 4.7% among cases of dermatophytosis.[2] In fact, onychomycosis can have significant negative effects on patient's emotional, social, and occupational functioning and can, also, consume a sizable proportion of health care dollars.

Affected patients may experience embarrassment in social and work situations, where they feel blighted or unclean, unwilling to allow their hands or feet to be seen. Patients may fear that they will transmit their infection to family members, friends, or coworkers, fears that can lead to diminished self-esteem and the avoidance of close relationships.[3] Onychomycosis is widely believed to be not only a cosmetic problem, but it can be uncomfortable and can lead to cellulitis in older adults.[4]

Eradication of the infection is the key to improving appearance and avoiding these complications, but it is not easily accomplished because nails are made of keratin, which is nonvascular and impermeable to many agents.[5] Because of poor drug delivery to nails, results of treatment may not be apparent for a year. Onychomycosis is divided into several classes based on morphologic patterns and mode of invasion of the nail. Classification provides a framework for diagnosis and expected response to treatment, and can help predict the prognosis. The classes include distal and lateral subungual onychomycosis, proximal subungual onychomycosis, superficial onychomycosis, and total dystrophic onychomycosis.

A fifth class, endonyx subungual onychomycosis, is rare.[6] Antifungals from the azole and allylamine classes are the most widely used oral medications for the treatment of onychomycosis. Several topical agents are used for the treatment of onychomycosis. Ciclopirox 8% solution is the only topical prescription medication available in the United States for the treatment of onychomycosis.[7,8]

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This study aimed to identify sex, age, classification, fungal culture, treatment, and incident of secondary infection in onychomycosis at Dermatology Outpatient Department at Sanglah General Hospital Denpasar Periods January 2016 – December 2017.

METHODS

Study design using retrospective descriptive cross sectional study by taking data from patient's medical records in Dermatology Outpatient Department at Sanglah General Hospital Denpasar. The population of this study was all new patients who came in Dermatology Outpatient Department at Sanglah General Hospital Denpasar. The samples were all new patients diagnosed with onychomycosis. The variable is sex, age, fungal culture, treatment, and incident of secondary infection in onychomycosis.

RESULTS

Based on research conducted in Dermatology Outpatient Department at Sanglah General Hospital Denpasar periods January 2016-December 2017 obtained the total patients were 268 patients, 29 (10,82%) of whom were diagnosed with onychomycosis (Table 1).

According to sex distribution, out of 29 patient diagnosed with onychomycosis from January 2016-December 2017, there were 11 (37.93%) male and 18 (62.06%) female patients. And according to age distribution, in 11 year age group 1 patients, in 12-25 year age group 6 patients, in 26-65 year age group 19 patients, in >65 year age group 3 patients had onychomycosis (Table 1).

According to classification of onychomycosis, out of 29 patients, there were 22 (75.86%) distal and lateral subungual onychomycosis, 4 (13.79%) proximal subungual onychomycosis, 1 (3.44%) superficial onychomycosis, 2 (6.89%) total dystrophic onychomycosis. According to fungal culture result, the most commonly isolated fungi was yeasts from the genera *Candida* (34.48%), followed by non dermatophytes *Aspergillus sp* (24.13), *Mucor sp* (6.89%), *Penicillium sp* (6.89%) and dermatophyte *T. Rubrum* (6.89%), *T. Mentagrophyte* (6.89%). (Table 2)

According types of therapy, there was combination therapy with systemic antifungal therapy and topical antifungal therapy 19 (65.51%) patient, systemic antifungal therapy 6(20,68%) patients, topical antifungal therapy 4 (13.79%) patient. For systemic antifungal that used in Dermatology Outpatient Department at Sanglah General Hospital Denpasar as therapy in onychomycosis, there were 7 (28.00%) patients given Itraconazole, 18 (72.00%) patients given Fluconazole. And for topical antifungal therapy, there were 7 (30.43%) patients given miconazole cream and ciclopirox, 3 (10,34%) patients given miconazole cream, 13 (56.52%) patients given ciclopirox. According to secondary infection lead from onychomycosis, there were 4 (13.79%) patient suffered onychomycosis with paronychia. (Table 2)

DISCUSSION

In this study, the samples taken were all patients of new cases with clinical diagnosis of onychomycosis, who came to treatment in Dermatology Outpatient Department at Sanglah General Hospital Denpasar periods January 2016 – December 2017 based on medical record. The total number of visits patients from January 2016 to December 2017 in Dermatology Outpatient Department at Sanglah General Hospital Denpasar 268 patients, 29 (10.82%) of whom were diagnosed with onychomycosis.

In table 1, according to sex distribution, females were more commonly affected with onychomycosis. There was 29 patient diagnosed with onychomycosis from January 2016-December 2017, 11 (37.93%) male and 18 (62.06%) female patients. In onychomycosis females were affected more frequently than males.[9] This fact is mainly due to onycholysis and paronychia of the fingernails caused by Candida species, which may come into contact with Candida organisms that reside in the intestine or vagina.[10]

According to age group, the most cases occur in 26-65 year age group 19 patients (65.51%) (Table 1). This result comparable with several studies that the incidence is much higher in adult than in children, afflicting 0.6% of children under the age of 18 years, approximately 10-20% of adults. Onychomycosis affects mainly adult although epidemiological data are limited, trauma and sports activities are risk factor.[11]

According to classification of onychomycosis out of 29 patients, there were 22 (75.86%) distal and lateral subungual onychomycosis, 4 (13,79%) proximal subungual onychomycosis, 1 (3.44%) superficial onychomycosis, 2 (6.89%) total dystrophic onychomycosis. This result is comparable with several studies that the most common clinical pattern was distal and lateral subungual onychomycosis (62%), followed by total dystrophic onychomycosis (20.2%).[6] According to fungal culture result, the most commonly isolated fungi was yeasts from the genera *Candida* (34.48%), followed by non dermatophytes *Aspergillus sp* (24.13%), *Mucor sp* (6,89%), *Penicillium sp.* (6,89%) and dermatophyte

Table 1 Onychomycosis Patient Distribution (Age and Sex)

	Male		Female		Result	
Age	**Total**	**Presentase(%)**	**Total**	**Presentase(%)**	**Total**	**Presentase(%)**
≤11 years	0	0	1	5.55%	1	3.44%
12-25 y.o	2	18.18%	4	22.22%	6	20.68%
26-65 y.o	7	63.63%	12	66.67%	19	65.51%
>65 y.o	2	18.18%	1	5.55%	3	10.34%
	11	100%	18	100%	29	100%

Table 2 Onychomycosis patient distribution

Classification of Onychomycosis	**Total**	**Percentage**
Distal and lateral subungual onychomycosis	22	75.86%
Proximal subungual onychomycosis	4	13.79%
Superficial onychomycosis	1	3.44%
Total dystrophic onychomycosis	2	6.89%
Endonyx onychomycosis	-	0%
Therapy	**Total**	**Percentage**
Combination therapy (Systemic antifungal + Topical antifungal)	19	65.51%
Systemic Antifungal	6	20.68%
Topical Antifungal	4	13.79%
Systemic Antifungal Therapy	**Total**	**Percentage**
Itraconazole	7	28.00%
Fluconazole	18	72.00%
Topical Antifungal Therapy	**Total**	**Percentage**
Miconazole cream + Ciclospirox	7	30.43%
Miconazole cream	3	10.34%
Ciclospirox	13	56.52%
Secondary Infection	**Total**	**Percentage**
With paronychia	4	13.79%
Without paronychia	25	86.20%
Fungal Culture		
Candida sp	10	34.48%
Mucor sp	2	6.89%
Aspergillus sp	7	24.13%
Penicillium sp	2	6.89%
T. Rubrum	2	6.89%
T. Mentagrophyte	2	6.89%

T. Rubrum (6,89%), *T. Mentagrophyte* (6.89%). This result is comparable with several studies the percentage of dermatophytes isolated from nails is usually low. For example, Pontes et al. found that the main fungi involved in onychomycosis in João Pessoa city, northeast Brazil were Candida species (82%), followed by dermatophytes (13.4%). Also, Brilhante et al. reported that the etiological agents most frequently found in cases of onychomycosis in Ceará (northeast Brazil) were Candida species (74.42%), followed by dermatophytes (12.99%) and *Fusarium sp*. (8.19%).[15] This fact is mainly due to onycholysis and paronychia of the fingernails caused by Candida species, which may come into

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contact with Candida organisms that reside in the intestine or vagina.[10]

According types of therapy, there was combination therapy with systemic and topical antifungal therapy 19 (65.51%) patient, systemic antifungal therapy 6(20.68%) patients, topical antifungal therapy 4 (13.79%) patient. For systemic antifungal that used in Dermatology Outpatient Department at Sanglah General Hospital Denpasar as therapy in onychomycosis, there were 7 (28.00%) patients given Itraconazole, 18 (72.00%) patients given Fluconazole. And for topical antifungal therapy, there were 7 (30.43%) patients given miconazole cream and ciclopirox, 3 (10.34%) patients given miconazole cream, 13 (56.52%) patients given ciclopirox. This result is comparable with several studies that Fluconazole has demonstrated good activity against dermatophyte fungi and many *Candida* spp. Two recent placebo-controlled trials of fluconazole at three dose levels (150, 300, and 450 mg) showed high efficacy and good tolerability in patients with distal subungual onychomycosis. In this study once-weekly dosing with fluconazole at any of the three doses resulted in a clinical success rate between 80 and 90%. The mean time to clinical success was 6 to 7 months.[12]

Evidence from several clinical trials supports the effectiveness of itraconazole in onychomycosis. In three multicenter, randomized, double-blind, placebo-controlled studies, a total of 214 patients received either itraconazole (200-mg capsules once daily) or a matching placebo for 12 weeks, this was followed by a 9-month follow-up period. Results in all three studies showed significantly greater improvement in patients treated with itraconazole than in those treated with placebo. Half of a cohort of patients with onychomycosis demonstrated improvement after treatment with a 2% miconazole nitrate formulation, according to findings presented at the American Academy of Dermatology Annual Meeting.[13]

Ciclopirox 8% solution is a synthetic hydroxypyridine antifungal formulated as a nail lacquer. When used alone, ciclopirox has a mycotic cure rate of 29% to 36% and a clinical cure rate of 6% to 9%. A Cochrane review noted that the treatment failure rate was 61% to 64% after 48 weeks of use. Ciclopirox has also been used in combination with oral agents to improve effectiveness. In one comparative study, a combination of ciclopirox and oral terbinafine had a mycotic cure rate of 88% and a complete cure rate of 68%.[7,8] According to secondary infection lead from onychomycosis, there were 4 (13.79%) patient suffered onychomycosis with paronychia. This result is comparable with several studies that this is one of the most commonly occurring dermatological conditions. International prevalence reports a range from 3-26% worldwide. The incidence of new cases of onychomycosis with paronychia appears to be rising due to the increasing prevalence of diabetes in the population, more frequent incidence of immunosuppression and an aging population.[4]

CONFLICT OF INTEREST

Author has no conflict of interest regarding all element in this study.

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