

Proportion of Fungal Infection in Fishmonger Traditional Markets in Medan City

Cut Mirshella Amanda*, Meidina Kesuma Wardani**, Lukmanul Hakim Nasution**

*Post graduate of Dermatology and Venereology, Faculty of Medicine, Universitas Sumatera Utara, Medan, Indonesia
**Departement of Dermatology and Venereology, Faculty of Medicine, Universitas Sumatera Utara, Medan, Indonesia

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Abstrak-Background: Dermatomycosis is estimated to affect about 20-25% of the world's population and is one of the most common forms of infection in humans. The causes of dermatomycosis are dermatophytes and *Candida* species.

Objective: To determine the proportion of fungal infections in the feet, hands and nails of traditional market fishmongers in Medan.

Methods: This study is a descriptive study with cross sectional method conducted from December 2018 to August 2019 involving 30 fishmonger who suffer from fungal infections at the Polyclinic of the Dermatology and Venereology in H. Adam Malik Hospital Medan. The diagnosis is based on anamnesis, clinical examination, microscopic examination using a 10% - 20% KOH solution from skin and nail scrapings, and fungal culture.

Results: The fishmonger who suffered the most fungal infections were 16 men (53.3%), in the age group 36-45 years, 12 people (40%). There were 5 fishmongers (18,5%) who mostly infected by *Candida Famata* species and diagnose with interdigital cutis candidiasis followed with 4 fishmongers (13.3%) who infected by *Candida albicans* species and also 4 fishmongers (13.3%) who infected with *Candida parapsilosis* species diagnosed with onychomycosis. There were 27 fishmongers (90%) who mostly diagnosed with interdigital cutis candidiasis and onychomycosis followed with 3 fishmongers (10%) diagnosed with onychomycosis. There were 20 fishmongers (66.7%) who had been working for over 5 years as a fishmonger.

Conclusion: Interdigital cutis candidiasis and onychomycosis were the most common fungal infection in fishmongers, followed by onychomycosis.

Index Term-Fungal infections, fishmongers

I. BACKGROUND

Dermatomycosis affects 20-25% of the world's population and is one of the most common forms of infection in humans.^{1,2} The most common causes of dermatomycosis are dermatophytes and *Candida* species.³

Dermatophytosis caused by dermatophyte fungi, attacks the skin, nails and hair containing keratin. This disease has a high morbidity and affects psychological effects, where men are more often than women.⁴

Candida is the main fungal pathogen of humans, causing diseases ranging from superficial mucosal infections to systemic infections that are often life-threatening.⁵ *Candida albicans* is the most common *Candida* found in 70-80% of cases.⁶

The most common dermatophytosis cause is *Trichopyton rubrum* which is 32.8% followed by *Trichopyton mentagrophytes* 29.2%.⁴

The prevalence of onychomycosis in the United States is 12%, while in Europe, France the highest prevalence is 16.8%, Germany 12.4%, Finland 8.4% and the United Kingdom 2.7%.⁴ The prevalence of tinea pedis and onychomycosis in Algeria, North Africa is 15% and 4.6%.⁷

Clinical diagnosis of fungals on the skin and nails by scraping using a 10-20% KOH solution and fungal culture. Fungal culture is the gold standard for species identification.⁸

II. METHODS

This study was a descriptive study with cross-sectional method. 30 fishmongers in traditional market from December 2018 to August 2019. Recording of basic data was collected by researcher at Dermatovenereology department of Haji Adam Malik Hospital. The recording of basic data includes the patient's identity and anamneses. Skin sample was scraped by laboratory workers of Pathology Clinical department Haji Adam Malik Hospital and culture was carried out by laboratory staff of Microbiology Department of Haji Adam Malik Hospital.

This study has obtained ethical clearance from the Research Ethics Commission Faculty of Medicine, University of North Sumatra.

III. RESULT

Characteristics of the study were the number of subjects suffering from fungal infections were most in the age group 36-45 years, total 12 people (40%) and 16 people were men (53.3%) more than 14 people were women (46.7%). Characteristics based on duration of work found that most subjects have worked as fishmongers for over 5 years is 20 people (66.7%), while the group with the least amount of 3-5 years is 3 people (10%).(Table 1)

Table 1. Subject Characteristic

Characteristic		N	(%)
Gender	Male	16	53,3
	Female	14	46,7
Age	17-25	6	20
	26-35	5	16,7
	36-45	12	40
	46-55	7	23,3
	>56	0	0
Working period	< 6 month	0	0
	6 month – 1 years	0	0
	1 years – 3 years	7	23,3
	3 years – 5 years	3	10
	> 5 years	20	66,7

The most common fungal infections were interdigital cutis candidiasis with onychomycosis about 27 people (90%) followed by onychomycosis were 3 people (10%).(Table 2)

Table 2. Fungal Infection

Fungal Infection	n	(%)
Onychomycosis	3	10
Interdigital cutis candidiasis + Onychomycosis	27	90

Table 3. Fungal Species

Location	Species	N	(%)	Total
Interdigital cutis candidiasis	<i>Candida albicans</i>	1	3,7	27
	<i>Candida parapsilosis</i>	4	14,8	
	<i>Candida famata</i>	5	18,5	
	<i>Cryptococcus laurentii</i>	1	3,7	

	<i>Candida duovushaemulonii</i>	1	3,7	
	<i>Candida guilliermondii</i>	1	3,7	
	Fungal growth was not found	14	51,8	
Onychomycosis	<i>Candida albicans</i>	4	13,3	30
	<i>Candida parapsilosis</i>	4	13,3	
	<i>Candida famata</i>	3	10	
	<i>Candida guilliermondii</i>	1	3,4	
	Fungal growth was not found	18	60	

The most species of fungal infections in interdigital cutis candidiasis of 27 people were *Candida famata* about 5 people (18.51%) and on onychomycosis were *Candida albicans* and *Candida parapsilosis* about 4 people (13,3%).(Table 3)

IV. DISCUSSION

In this study, there were more male gender subjects than females, 16 males (53.3%). In Adhiguna and Lestari's research on dermatomycosis conducted at the main state medical education hospital in Indonesia in 2009-2011 found that the incidence of dermatomycosis incidence was similar in men and women. Most cities show more males than females, perhaps due to work factors that involve more physical and hot condition so that a lot of sweating and facilitate the occurrence of dermatomycosis.⁹

Study by Lubis in H. Adam Malik General Hospital in Medan in 2014 found the number of subjects with onychomycosis were more often in women (71.4%).¹⁰ Study by Setianingsih in 2015 on pig farms from 40 samples found more tinea unguium sufferers in women than in men, there 10 (71%) and 4 (29%), 8 people had worked for more than 5 years (57%).¹¹

Research conducted in Dermato and Venereology Polyclinic of RSUP Prof. Dr. R. D. Kandou Manado in January-December 2012 period showed that from 65 cases of dermatophytosis (1,61%) of all dermato and venereology cases in 2012, the most gender were female (67,70%).¹²

Research conducted by Soetojo and Astari in 2011-2013 in Regional Hospital Dr. Soetomo Surabaya, from 114 patients with skin infections and 23 patients with nail infections, the most gender was female, that in 2011 (54,3%), 2012 (80%), and 2013 (56,6%).¹³ The study by Rizal et al on 2011 at H. Adam Malik General Hospital in Medan from 33 onychomycosis patients, the most gender was female, 24 patients (72,7%) and 9 men (27,3%).¹⁴

In this study the highest frequency of occurrence in the 36-45 year age group was 12 people (40%) and the least in the 26-35 year age group was 5 people (16.7%). Study by Lubis in H. Adam Malik General Hospital in Medan on onychomycosis found the most common age group were in 16-25 years old (22,9%) and 56-65 years old (22,9%).¹⁰ Study by Harahap in 2009-2012 at H. Adam Malik General Hospital in Medan found that the most incident on onychomycosis were in 18-45 years old (1,9%) from all of dermatomycosis incident.¹⁵

A retrospective study conducted at Dermatovenereology clinic of Prof. Dr. R.D.Kandou Manado General Hospital in 2009-2011 out of 10,003 patients who visited showed that the women most likely to suffer from cutaneous candidiasis (61.25%), in the 45-64 age group (38, 13%). This study was conducted retrospectively on patients with cutaneous candidiasis who came to Dermatology clinic and the results obtained showed that from a total of 10,003 visits there were 160 people (0.53%) new patients with cutaneous candidiasis, 26.27% of 598 new cases of fungal disease, with the highest type of candidiasis is intertriginous candidiasis (95.63%).¹⁶

Research conducted by Soetojo and Astari in 2011- 2013 at Regional Hospital Dr. Soetomo Surabaya, from 114 patients with skin infection and 23 patients with nail infection, the most common skin infections were intertriginous candidiasis (62,2%), candidiasis infections on the skin and nails (91,3%).¹³

Research conducted by Puspitasari et al in candidiasis patients in Mycology Division of Dermatovenereology Outpatient Unit Dr. Soetomo Surabaya on 2013-2016, in 298 new patients there were 14 cases of interdigital candidiasis (4.7%).¹⁷

In this study, from the clinical feature shows that it is a tinea pedis et manum, but at the time of examination of fungal cultures obtained the most species were candida. Study by Otasevic et al in 2016, 761 patients onychomycosis were found, from the results of 137 culture tests caused by *Candida*, consisting of *Candida albicans* (36.59%), *Candida parapsilosis* (23.78%), *Candida krusei* (9.76%), and *Candida guilliermondii* (6.71%).¹⁸

Jamaliah research in 2014 on tofu factory workers in Medan Deli sub-district in Medan, from the results of dermatomycosis culture

obtained *Candida sp* (61.1%), *Aspergillus fumigates* (11.11%) and *M. gypseum* (5.55%).¹⁹

Retrospective studies conducted by Tan in Singapore showed the most common causes of onychomycosis were *Candida albicans* (37.9%) and non dermatophyte molds (5.6%).²⁰

Study by Lubis in H. Adam Malik General Hospital in Medan on 2014 found that the species of onychomycosis was *Candida albicans* about 15 people (42.8%). Some factors that could cause no fungal growth were found due to differences in the sample collection process, differences in culture media, differences in optimal temperature, inadequate number of culture samples and site selection.¹⁰

V. CONCLUSION

Candidiasis cutis interdigitalis and onychomycosis were the most common fungal infection in fishmongers, followed by onychomycosis.

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AUTHORS

First Author – Cut Mirshella Amanda, Post graduate of Dermatology and Venereology, Faculty of Medicine, Universitas Sumatera Utara, cutmirshella@yahoo.com

Second Author- Meidina Kesuma Wardani. Departemen of Dermatology and Venereology, Faculty of Medicine, Universitas Sumatera Utara

Third Author- Lukmanul Hakim Nasution, Departemen of Dermatology and Venereology, Faculty of Medicine, Universitas Sumatera Utara