

Prevalence of ringworm or dermatophytosis, A retrospective study of age-related infections among patients attending Halibet national referral hospital, dermatological clinic from 2014 - 2018 in Asmara, Eritrea

Abstract

Background: Globally skin diseases are major health problem. These skin diseases are caused by different types of Tinea infections that include: Tinea barbae, Tinea capitis, Tinea corporis, Tinea cruris, Tinea faciei, Tinea manuum, Tinea pedis and Tinea unguium. The prevalence of the skin diseases ranges from 25% to 45.3%; the worldwide prevalence rate of fungal infections is within the range of 20 - 25 % globally (WHO, 2005). This wide variation of disease prevalence and pattern among countries is because of different skin type, occupation, age, sex, level of immunity and culture.

Objective: The aim of the study was to identify which age groups are more susceptible to Tinea (Ringworm) infections among patients who attended Halibet National Referral Hospital, Dermatologic Clinic from 2014 to 2018 Asmara, Eritrea.

Methods: A five year retrospective record review was done to identify the more susceptible age group for superficial fungal skin infections and its determinants in outpatients who attended dermatologic Clinic at Halibet National Referral Hospital, Asmara, Eritrea from 2014 to 2018. The data was analyzed using SPSS version 22.

Results: Out of these patients who came from the whole country as referral and self-referral, 5524 (17.18%) were diagnosed clinically as cases with different types of Tinea infections. The study results also indicated an increased trend of skin diseases. Tinea skin infections was found to be highly common among children [76% (n=4201)]. The study also revealed that a significant association ($P<0.000$) between age and site/type of an infection.

Conclusion: The study concludes that a higher prevalence of skin fungal infections among infants and child age group (0-13 years of age). Indicating that with an increase of age the diseases prevalence was found to be lower. The study also revealed that a significant association ($P<0.000$) between age and site/type of an infection.

Keywords: ringworm, dermatophytes, age groups, tinea, Eritrea

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Introduction

Globally skin diseases are major health problem. These skin diseases are caused by different types of Tinea infections that include: Tinea barbae (an infection of the beard area), Tinea capitis (infection of the scalp hair follicles and the surrounding skin), Tinea corporis (dermatophytosis of the trunk), Tinea cruris (dermatophytosis of the groin), Tinea faciei (dermatophytosis on the face, chin and lip), Tinea manuum (affects one hand), Tinea pedis (a fungal infection that affects the toe) and Tinea unguium (infection of the nails). The prevalence of the skin diseases ranges from 25% to 45.3%. The worldwide prevalence rate of fungal infections is within the range of 20 - 25 % globally (WHO, 2005). Reports from different African countries emphasizes a heavy burden of dermatophytosis. Throughout the entire African continent the principal clinical presentation of dermatophytosis in children is Tinea capitis. In the West African countries Tinea capitis affects more than 20% of school-age children, whereas the prevalence ranges 10% to 70% in the remaining regions of Africa. This wide variation of disease prevalence and pattern among countries is because of different skin type, occupation, age, sex, level of immunity and culture.¹ A systematic review study

on the epidemiology of fungal infections in China revealed a high prevalence of fungal diseases in immune-compromised individuals.² Dermatophytes are filamentous type of fungi that cause a skin mycosis known as Tinea or ring worm. These fungi colonize the keratinized tissues of the corneous layer of skin, hair and nails.³

The incidence of dermatomycosis varies from one country to another. Fungal infections are common at the foot, head and neck area. A retrospective study (2009 to 2014) on the prevalence of cutaneous fungal infections in Sari, Iran, documented higher prevalence of 25.7% , 13.9% and 8% of lesions at foot, face and neck, and scalp.⁴

An age standardized study that was conducted at the Birmingham Research unit in UK documented a yearly incidence of 16 per 10,000 persons.⁵ Another laboratory based survey in UK that was conducted from 1980 to 2005 identified 15,333 dermatophytes isolates which are of different types with different frequencies of *E. floccosum* (human groin and foot infections), *M. canis* (cat and dog ringworm), *T. mentagrophytes* (rodent ringworm) and *T. verrucosum* (cattle ringworm). However, the *T. tonsurans* and *T. violaceum* (two anthropophilic scalp-infecting species) provides an increment to total

dermatophyte isolations by 1000% over the same period. The two well-known causes of foot infections *T. rubrum* and *T. interdigitale* made-up 80% and 90% of all dermatophytes isolates in 1980 and 2005, respectively. Due to the anatomical differences in the perennial and scrotal area, the occurrence of Tinea cruris is three times greater in males than females. The higher prevalence of this disease is a common condition in males.

Methodology

Study design and area

A retrospective clinical card/record review study of five years was conducted to assess which age groups were more susceptible to Tinea (Ringworm) infections. The study was done among outpatients who attended Dermatologic Clinic from 2014 to 2018 at Halibet National Referral Hospital, Asmara, Eritrea.

For searching the electronic databases the following key words were used: Dermatophytes, Tinea, Age, Africa, and Eritrea

Data processing/Data entry

Primarily data cleaning was performed for avoiding missed values during data collection and entry, checking accuracy and consistency. The data entered into Microsoft excel and finally was exported to SPSS.

Data analysis

The data was analyzed using Statistical Package for Social Sciences (SPSS) version 22. After analysis the data were presented in tabular

Table 1 Epidemiologic data, patients who visited the dermatology clinic from: 2014 -2018

Year	Total number of patients with skin diseases (Frequency; N)	Patients with skin fungal infection (Frequency; N)	Patients with skin fungal infection (Percent; %)
2014	5373	956	17.3
2015	7388	1046	18.9
2016	6344	1082	19.6
2017	6048	1221	22.1
2018	7000	1219	22.1
Total	32,153	5524	100

Table 2 Epidemiologic data of patients with Tinea infections by age

Characteristics	Frequency (N)	Percent (%)
Age in Years		
Infant (0 -2 years)	186	3.4
Child (3 - 12 years)	4201	76
Adolescent (13 - 18 years)	483	8.7
Young adult (19 – 30 years)	304	5.5
Adult (31 – 50 years)	214	3.9
Senior (≥ 50 years)	111	2
Missed	25	0.5
Total	5524	100

Table 3 Association between site of infection and Age Group

Characteristics	Frequency (N)					P-Value
	Infant and child (0 – 13 yrs)	Adolescent (13 - 18 yrs)	Young adult & adult (19 -50 yrs)	Senior ≥ 50	Total	
Body	319 (54.9%)	59 (10.2%)	176 (30.3%)	27(4.6%)	581 (10.6%)	P < 0.000
Face	188 (59.1%)	84 (26.4%)	36 (11.3%)	10 (3.1%)	318 (5.8%)	
Groin	2 (2.6%)	16 (20.5%)	46 (59.0%)	14 (17.9%)	78 (1.4%)	
Hand	25 (16.4%)	25 (16.4%)	69 (45.4%)	33 (21.7%)	152 (2.8%)	
Head	3842 (90.2%)	284 (6.7%)	111 (2.6%)	24 (0.6%)	4261(77.5%)	
Foot	11 (10.1%)	15 (13.8%)	80 (73.4%)	3 (2.8%)	109 (2.0%)	
Total	4387 (79.8%)	483 (8.8%)	518 (9.4%)	111 (2.0%)	5499	

form using descriptive statistics, frequency and percent. The data was also analyzed by Chi-Square test for identifying an association between the variables.

Results

General skin disease and Skin fungal infections

The Dermatology Clinic of Halibet Hospital had treated a total of 32,153 outpatients in the five years between 2014-2018. Out of these all patients who came from the whole country as referral and self-referral, around 5, 524 (17.18%) were diagnosed clinically as cases with different types of Tinea infections. The study finding revealed an increase of skin diseases in the five years from 956 in 2014 to 1219 in 2018 (Table 1).

Socio-demographic characteristics of patients with skin fungal infections: 2014 – 2018

Tinea skin infections were found to be highly common with a prevalence of 76% (n=4201) among children whose age was between (3-12yrs), whereas it was found in low frequency in the age group of Adolescents (13-18 yrs.) young adults (19-30yrs), adults (31-50yrs), infant (0-2yrs) and senior (>50yrs), with prevalence of 8.7%, 5.5%, 3.9%, 3.4% and 2%, respectively (Table 2).

Site of infection and Age Group

The study results indicated that there is a strong association between site of infection and infants and children (0 – 13 years) at a p value < 0.000. (Table 3)

Discussion

During the five years (2014 - 2018) a total of 32,153 patients were attended Halibet Regional Referral Hospital due to different types of skin diseases (Ringworm), out of these 5,524 (17.18%) were identified to have problems related to Tinea (skin fungal infections). Hence, the study analyzed clinical cards of these 5,524 patients who attended Dermatology Clinic at Halibet Regional Referral Hospital.

The prevalence of Tinea skin infections was found to be highly common among children whose age was between 3-12yrs (76%), whereas it was found in low frequency in the age group of 0-2yrs (infant) ,13-18yrs (adolescents), 19-30yrs (young adult), 31-50yrs (adults), and above 50yrs (senior), with a frequency of 3.4% , 8.7%, 5.5%, 3.9%, and 2% respectively. The high prevalence in 3–12 years age group might be due to their close contact with animal's frequency of playing on contaminated soils and close contact with friends at school and use of common dressing and showering materials as they are unaware of the common transmission methods. The lower prevalence of skin fungal infections in adolescents, young adult and adults might be due to their age as these age groups of the population can do self-care and maintain their personal hygiene, whereas children usually stay playing at the field and have continuous contact with their peers.

The study findings indicated that Tinea skin infection affect mainly/ commonly the head and the study participants who were affected by head skin fungal infections were as prevalent as 77.5%. The least skin fungal infection was found to be in the groin with a prevalence of 1.4 %. The study revealed that the most affected age group were infants and children (0 – 13 years of age) with a prevalence of 79.8% (N=4387). A review study in African countries reported that skin fungal infections as highly common among children as adults.^{6,7} Whereas the other age groups, young adults and adults (19 -50 years of Age), adolescent (13 - 18 years of Age) and senior (> 50 years of Age) were found to be 9.4% (N = 518), 8.8% (N= 483) and 2.0% (N=111), respectively. The study showed a significant association between area of infection and the infant and child age group at p-value < 0.000. The study results revealed that Tinea pedis to be highly prevalent in the young adults and adults (19 -50 years of Age) which is different from an epidemiological and aetiological study on Tinea pedis and onychomycosis that was conducted in Algeria that documented a higher prevalence rate of Tinea pedis in the age group between 50–59 years.⁸

Conclusion

The overall prevalence of Tinea skin fungal infections was found to be highly common with a prevalence of 76% (n=4201) among children whose age was between (3-12yrs), whereas it was found in low frequency in the age group of Adolescents (13-18 yrs.) young adults (19-30yrs), adults (31-50yrs), infant (0-2yrs) and senior (>50yrs), with prevalence of 8.7%, 5.5%, 3.9%, 3.4% and 2%, respectively. Hence with an increase in age the diseases prevalence was found to lower. The study also revealed that a significant association (P<0.000) between age and site/type of an infection.

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Ethical considerations

Ethical approval for the research was obtained from Eritrea Institute of Technology Research and Postgraduate Studies, Mai-Nefhi, Eritrea.

Conflicts of interest

The authors declare that there are no competing interests.

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