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EPIDEMIOLOGICAL STUDY OF DERMATOPHYTE INFECTION IN PATIENTS ATTENDING A TERTIARY CARE HOSPITAL IN WESTERN MAHARASHTRA

Dermatology

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ABSTRACT

Introduction : The epidemiology of dermatophytoses has exhibited notable changes over the past decades as a consequence of variation in some environmental conditions. The distribution of the etiological agents usually reflects the changing clinical patterns of dermatophytoses.

Aim: The aim of the present epidemiological study is to analyze the incidence and prevalence of dermatophytoses and the corresponding causative species among the patients attending the dermatology OPD

Methodology: A total of 111 clinical cases of dermatophyte infections were collected from patient visiting the Dermatology Department in RCSM GMC and Teaching Hospital, Kolhapur in western Maharashtra. The data was collected from January 2017 to June 2017.

Results: Our study showed more prevalence of dermatophyte infection in males than females. In the present study persons of all age groups were susceptible to dermatophytes but more common in adults of age 30 to 49 and then in 20-29 years of age. (94.6%) samples were culture (KOH) positive for dermatophytes. In our study predominant clinical condition was T Cruris (37.84%) followed by T.Corporis (27.03%) and among mixed site infections, T. Cruris and T. Corporis was more common. Among all clinical patterns, T. rubrum was the chief organism isolated with percentage of 54.05% followed by T. Tonsurans and T. Mentagrophytes.

Conclusion: It may be concluded from the present study that the mixed hot with humid climatic conditions of western Maharashtra favour Dermatophytosis infections. Among these Tinea cruris was the most frequent clinical condition followed by tinea corporis. T. rubrum was implicated as the predominating species followed by T. Tonsurans and T. mentagrophyte.

KEYWORDS

Dermatophyte, Epidemiology, Western Maharashtra

INTRODUCTION:

About 20-25% of global population is commonly affected by superficial mycoses. Out of which, the most common are dermatophyte infections1. Age, sex, genetics, racial factors, lifestyle, drug therapy; metabolic-endocrine disorders such as diabetes mellitus, contact with animals and environmental factors are affecting these infections.2-4 The demography of dermatophytes have been recorded all over the world but with variation in distribution, incidence, epidemiology and target hosts from one location to another. Geographical location, climate (temperature, humidity, and wind), overcrowding, healthcare immigration, lifestyle, hygiene, culture and socioeconomic conditions have been incriminated as major factors for these variations.[1,4-7]

Dermatophytoses are caused by anthropophilic, zoophilic, geophilic (based on their natural habitats) or keratinophilic fungi that are capable of invading nail, hair and superficial layers of the skin of human-beings and animals.8,9 They produce keratinase which is a proteolytic enzyme, capable of hydrolysing keratin that help the fungi to invade and digest keratin which is the major protein constituent of hair, nail and skin.10-12 Forty different species of dermatophytes have been identified and approximately 20 of them are responsible for most of the infections in humans.13 Infections may have mild to severe symptoms depending on the immunological response of the host.11,12 Distribution and prevalence of various species of infective dermatophytic agents vary among different areas.[4,14]

The incidence of fungal infection is constantly increasing, especially of resistant fungal infections. This increase may be due to frequent usage of antibiotics, immunosuppressive drugs and various conditions like diabetes mellitus, organ transplantations, lymphomas, leukemia and human immunodeficiency virus (HIV) infections. Accordingly, accurate diagnosis, appropriate treatment of these infections, health seeking behaviors and hygiene reduce their transmission and complications.[15]

The epidemiology of dermatophytoses has also exhibited notable changes over the past decades as a consequence of variation in some environmental conditions and the distribution of the etiological agents usually reflects the changing clinical patterns of dermatophytoses. The aim of the present epidemiological study is to analyze the incidence and prevalence of dermatophytoses and the corresponding causative species among the patients attending the dermatology OPD between January to June 2017 in western Maharashtra.

MATERIALS AND METHODS:

.Data and Sample Collection

A total of 111 clinical cases of dermatophyte infections were collected from patient visiting out-patient Dermatology department in Rajarshee Chatrapati Shahu Maharaj Government Medical College and Teaching Hospital, Kolhapur in western Maharashtra. The data was collected from January 2017 to June 2017. The infected area was cleaned with 70% (v/v) ethanol before collecting the sample. Then samples were collected by scrapping the lesions of the skin and finger nail with sterile blade and dull broken hairs from the margin of scalp lesion with forceps and transferred to sterile folded papers. Each of these papers was labeled with the age, sex, date of collection, code of a patient, and location of infection accordingly. Samples were then taken to the Microbiology Laboratory of our institute within the date of collection.

Culture and microscopic examination

A portion of each sample was mounted in a drop of an aqueous solution of 10percent (w/v) potassium hydroxide (KOH) on a clean microscopic slide .After 5 minutes of mounting the preparation was examined under low (x10) and high (x40) power magnification for the presence of fungal filaments. The remaining portion of each clinical sample was cultured irrespective of the negative or positive direct microscopic examination results onto plates of Sabourauds dextrose agar containing Chloramphenicol with and without Cycloheximide. All inoculated plates were then incubated at inverted position for 4-6weeks at 25-30oC aerobic ally. Culture plates were examined twice a week for any fungal growth. The cultures of dermatophytes were identified by examining macroscopic and microscopic characteristics of their colony.

OBSERVATIONS AND RESULTS:

Table I: Distribution of frequency of dermatophytic infections according to Age and Sex

Age Group	Male (%)	Female (%)
0-9	02	00
10-19	11	01
20-29	10	06
30-39	15	13
40-49	14	12
50-59	04	07
60-69	11	03
70-79	02	00
Total N= 111(%)	69 (62.16)	42(37.84)

Table II - Frequency of clinical presentation of dermatophytic Infections n= 111

Area involved	Clinical presentation	Number (%)	KOH Test	
			+ve	-ve
Single	Tinea cruris	42 (37.84)	40	02
	Tinea corporis	30 (27.03)	28	02
	Tinea faciei	09 (08.11)	08	01
	Tinea pedis	03 (02.70)	03	00
	Tinea manuum	03 (02.70)	03	00
Multiple	T.Corporis +T.Paedis	01 (00.90)	01	00
	T.cruris+ T.Corporis	18 (16.22)	17	01
	T.cruris+ T.Paedis	01 (00.90)	01	00
	T.cruris+ T.Corporis +T.Paedis	01 (00.90)	01	00
	T.cruris+ T.Corporis +T.Faciei	03 (02.70)	03	00
	Total	**111**	**105**	**06**

Table III - Frequency of Isolated Dermatophytic species

Species	Number n-111(%)	DM Positive	RVD positive
T.Rubrum	60 (54.05)	15	01
T. Tonsurans	27(24.32)	04	02
T. Mentagrophytes	24(21.63)	05	03

DM- Diabetes RVD- Retroviral disease

DISSCUSION:

In the present study total 111 clinical samples were collected from patients with diagnosis of dermatophytoses in the Department of Dermatology, RCSMGMC in the period of January 2017 to June 2017.

Our study showed that there is more prevalence of dermatophyte infection in males (62.16%) than females (37.84%). V.K Bhatia et al16 found that 85.1% were males and rest females with dermatophyte positive cases. Such higher prevalence in males has been reported in India as well as other countries of the world by several researchers.17, 18 In various studies, researchers noted same and explained that the reason may be due to the differences in occupational exposure of both the sexes as males are more involved in construction and other works.19-22 In contrast to our results some studies presented a higher prevalence of dermatophytes in females compared to males.23-28 In the present study persons of all age groups were susceptible to dermatophytes but it appeared to be more common in adults of age 30 to 49 and then in 20-29 years of age as they are physically active outdoors. Our finding in this regard was compatible with the findings of others.29-30 We found minimum age of 8 years to maximum 75 years of patients.

All samples were detected by KOH wet mount and 105 (94.6%) samples were culture positive for dermatophytes. This prevalence rate of culture proven dermatophytic infection was relatively very high, compared to study of Ethiopia survey among school children with rates between 33% and 73%.[31, 32] Kannan et al33 reported the prevalence rate of KOH proven dermatophyte infections ranging from 53.1% to 100%. In Kak Surendran's study34, it was possible to demonstrate fungi on direct microscopy with KOH in 96 cases but overall positivity by culture was 39% as noticed in other studies.[35,36] However, a study by Belukar et al[37] showed culture positivity of 71%, which was much higher while study at Aurangabad showed low rate of culture positivity of 22.8%.

In our study predominant clinical presentation was T Cruris (37.84%) followed by T.Corporis (27.03%). This is in accordance with the Bindu et al[35]. study and other studies, which have also stated that tinea corporis and tinea cruris are the most common clinical type of dermatophytic infections.[17, 37-38] Sardari et al[39] and Verma et al[40] in their studies reported that tinea cruris was the most common clinical type. The study conducted in Iran by Rassai et al26 revealed that tinea cruris and tinea corporis were the most common clinical manifestation and most common presentation was tinea cruris in men and tinea corporis in women. A study carried out by Devliotou Panagiotidou et al28 in Greece noted that tinea pedis was the most frequent clinical manifestation. Adefemi et al19 reported tinea capitis as a predominant clinical manifestation. In our study, among mixed site infections T. Cruris and T. Corporis ware more common. Similar findings have been reported by Peerapur et al[41]. In contrast to our result another clinicomycological study of superficial mycosis in a hospital in north-east India by Grover et al[42] observed tinea pedis (29.2%) as the most common dermatophytoses followed by tinea cruris (26.2%). Similar to us in the another study no case of tinea capitis was noticed confirming its low incidence.34, 43 A study done at urban clinic Kolkata showed that tinea capitis was the most common dermatophytic infection in children.[44]

In our study among all clinical patterns, T. rubrum was the major organism isolated (54.05 %), T. Tonsurans (24.32 %) was the second dominant followed by T. mentagrophytes (21.63%) . This is in accordance to reports of other workers from different regions of India.17, 35, 42,44, 45 This correlates to the study of Grover et al42 done in north-east India and his study isolated T. Tonsurans as the most common dermatophyte followed by T. rubrum. The study from Kak et al34 and Bindu35 showed that, T. rubrum was the chief organism (55.5%) followed by T. mentagrophytes (33.3%) from the infected skin, which is in agreement with majority of other studies reported from India and other countries.[17,35,36,45] The heterogeneity in the distribution of dermatophytoses, their etiologic agents, and the predominating clinical manifestation, clinical patterns in different parts of the world have been attributed to factors of geographic location, climate, overcrowding, health care, immigration, environmental hygiene culture, and socioeconomic conditions 1, 2, 4-6.

CONCLUSION:

It may be concluded from the present study that the climatic conditions of western Maharashtra favours dermatophytoses. Tinea cruris was the most frequent clinical condition followed by tinea corporis. T. rubrum was implicated as the predominating species followed by T. Tonsurans and T. mentagrophyte. Because of the psychological effects and high morbidity in terms of loss of working days and treatment of dermatophytic infection it is a public health problem. Therefore, to obtain a true representation of the overall disease pattern of the country more such types of studies should be conducted. Proper surveillance of fungal pathogens is important to improve quality of care in critical care setting and measures should be focused to control these infections, especially in patients with these risk factors. Although, the present study is a random study that focuses primarily on the prevalence of different dermatophyte species in the western Maharashtra, more systematic study covering larger population and over a longer period of time would give a better insight into the epidemiology of dermatophytoses in the state.

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