|| ISSN(online): 2589-8698 || ISSN(print): 2589-868X ||
International Journal of Medical and Biomedical Studies
Available Online at www.ijmbs.info
PubMed (National Library of Medicine ID: 101738825)
Index Copernicus Value 2018: 75.71
Original Research Article
Volume 4, Issue 1; January: 2020; Page No. 99-102

SPECTRUM OF FUNGAL INFECTIONS IN THE ELDERLY AGE GROUP

Kshitij Saxena[1]*, Priyanka Shukla[2], Harris I Shaafie[3], Gaurav Paliwal[4], Chandni Jain[5]

[1]Associate Professor, Dept. of Dermatology, Venereology and Leprosy, Era's Lucknow Medical College & Hospital, Lucknow, U.P., India

[2]Professor, Dept. of Microbiology, Era's Lucknow Medical College & Hospital, Lucknow, U.P., India

[3]Resident, Dept. of Dermatology, Venereology and Leprosy, Era's Lucknow Medical College & Hospital, Lucknow, U.P., India

[4]Senior Resident, Dept. of Dermatology, Venereology and Leprosy, CSJMU, Kanpur University, U.P., India

[5]Resident, Dept. of Dermatology, Venereology and Leprosy, Era's Lucknow Medical College & Hospital, Lucknow, U.P., India.

Article Info: Received 10 December 2019; Accepted 14 January. 2020
DOI: https://doi.org/10.32553/ijmbs.v4i1.833
Corresponding author: Kshitij Saxena
Conflict of interest: No conflict of interest.

Abstract

Introduction: Fungal infections have become a common problem in the elderly age group. As age advances, the skin becomes dry, thin, wrinkled and with a smaller number of hair follicles, sweat glands and sebaceous glands; therefore, making it more susceptible to opportunistic pathogens. Superficial mycosis account for nearly 25% of the global burden of skin mycoses. The aim of this study is to identify the various superficial mycosis occurring in the elderly age group > 60 years attending a tertiary care hospital in North India.

Materials and Methods: Prospective, observational study conducted on 540 patients over the age of 60 years attending the Dermatology OPD at a tertiary care center. Patients on antifungal agents were excluded from the study. Samples collected included skin scrapings along with nail and hair clippings. The collected samples were divided into two parts; one for culture and the other for direct microscopy. Direct microscopy of the specimens was performed in 10% potassium hydroxide + 40% Di-methyl sulfoxide. Culture media used included Sabouraud's dextrose agar (SDA) and SDA containing Cycloheximide (0.5 mg/ml). Cultures were incubated at both 25ºC and 37ºC for four weeks. Further species identification was done by Microslide culture technique.

Results: The M:F ratio was 1.36:1. Onychomycosis accounted for the majority of superficial mycoses (25%) followed by Tinea pedis (15.51%) and Tinea mannum (14.65%). The most common dermatophyte isolate was Trichophyton rubrum (27.58%), followed by T. mentagrophytes (22.41%) and T. verrucosum (17.24%).

Keywords: Dermatophytes, Superficial Mycoses, Elderly age

Introduction

An elderly age group comprises of people more than 60 years of age (1). World Health Organization estimates that nearly two billion people across the world are expected to be over 60 years of age by 2050, a figure that is more than triple of what it was in 2000 (1). India is the second largest country in the world, with 72 million elderly persons as of 2001, which is expected to increase to 179 million in 2031 and further to 301 million in 2051 (2). As age advances, the skin becomes dry, thin and wrinkled with reduced number of hair follicles, sweat glands and sebaceous glands therefore making it more susceptible to pathogens, which may also be due to resident skin flora becoming opportunistic (3). Along with systemic diseases, elderly people are more prone to superficial cutaneous and systemic mycoses. Superficial mycoses affect skin and its appendages including hair and nails and account for nearly 25% of the global skin mycoses, making them as one of the most common types of fungal infections all over the world (3). Dermatophytosis refers to superficial fungal infections caused by either of the three groups of keratinophillic fungi, namely, trichophyton (infects skin, nails and hair), microsporum (infects skin and hair) and epidermophyton (infects skin and nail) (4). These comprise the most common agents responsible for superficial mycosis (5,6). Candidiasis is caused by Candida species and results due to over-judicious use of corticosteroids, antibiotics and immunosuppressive agents. Onychomycosis (OM) is a common fungal infection affecting elderly people, affecting males more frequently than females (7). In addition, environmental factors including hot and humid climate, poor sanitation, overcrowding, low socioeconomic strata etc. are associated with the development of fungal infections in the Indian subcontinent. The purpose of this study was to estimate the prevalence and identify the various superficial fungal infections occurring in the elderly

age group attending a tertiary care hospital in north India (8-14)

Materials and Methods:

The study was conducted at the department of Dermatology at Era's Lucknow Medical College and Hospital, Lucknow, Uttar Pradesh in collaboration with the department of Microbiology from November 2016 to May 2018. All patients having superficial fungal infections were included in the study and five age groups were created: 60-64 years, 65-69 years, 70-74 years, 75-79 years and >= 80 years. Patients on anti-fungal and immunosuppressive agents were excluded from the study. A total of 540 patients were enrolled in our study after obtaining informed written consent. A detailed history of chief complaints, present and past history, treatment history, drug history and history of any chronic illness was taken. All findings were recorded in a case record form. In patients affected with fungal infections, samples were collected employing proper aseptic techniques from skin and nail scrapings, hair along with root and nail clippings. The collected samples were divided into two parts, one for direct microscopy and the other for culture. Direct microscopy of the specimens was performed in 10% potassium hydroxide + 40% Di-methyl sulfoxide. The presence of fungal hyphae or budding yeast like cells was recorded (Figure 3). The second part of the sample was inoculated onto two different sets of media, including Sabouraud's Dextrose Agar (SDA) (Figure 1) and SDA containing Cycloheximide (0.5 mg/ ml) (Figure 2). Cultures were incubated at both 25ºC and 37ºC for four weeks. Lactophenol cotton blue mounts were prepared from cultures showing growth of colonies and examined under low power microscope to study microscopic features of the colony and for presence of conidia. Further species identification was done by micro slide culture technique. Budding yeast like cells were identified by germ tube test, and blastopore formation in cornmeal agar by Dalmau culture plate. Cultures showing no growth were kept for 4 weeks to be declared as negative. All findings were noted and results were analysed.

Discussion:

The spectrum of various species causing superficial fungal infections has not been recently documented from our region and treatment is mostly empirical. Therefore, the present study was undertaken to describe the prevailing spectrum and frequency of various fungal isolates causing Dermatophytosis. The present study included 540 patients attending the Dermatology OPD. Majority of the patients belonged to age group of 65-69 years (n=297, 55%). The patients showed varied physiological presentations, the most common being wrinkling of the skin (n=437, 80.92%). Similar findings were observed by Sheetal et al (16), Grover et al (17) and Raveendra L (18) in their study. Other manifestations in decreasing order included xerosis (n=302, 55.92%), idiopathic guttate hypomelanosis (n=133, 24.62%), solar lentigines (n=89, 16.48%) and senile comedones (n=57, 10.55%). Among the pathological changes, benign tumors accounted for the majority (n=244, 45.18%) of cases followed by cherry angiomas and seborrheic keratosis (n=163, 30.2% and n=127, 23.5% respectively). Grover et al. (2009) found seborrheic keratosis in 43% and cherry angioma in 63% cases in their study (17). Infestations were seen in 92 patients (17%), out of which scabies was seen in 76 (14.1%) and pediculosis in 16 patients (3%). In our study, infections were seen in 229 (42.3%) cases out of which fungal infections accounted for 21.4% (n=116) cases. These patients were referred to the dept. of Microbiology for detection of fungal elements in the skin, hair and nail specimens. Out of the 21.4% cases, 7.0%, n=38 and 14.4%, n=78 were candidiasis and dermatophytosis respectively. In a study done by Jindal et al. (2016), fungal infections were found in 18% cases (19). In decreasing order, the most common fungal manifestation was Onychomycosis (OM) (Figure 4) accounting for 25% cases (n=29) followed by Tinea Pedis (15.51%), Tinea manuum and Pityriasis versicolor (14.65% each). The prevalence of OM increases with age; it is less than 1% in persons younger than 19 years and rises to about 18% in those who are aged 60 to 79 years. Most common dermatophyte isolate was Trichophyton rubrum (n=32, 27.58%) (Figure 2), followed by T. mentagrophytes and T. verrucosum. Non dermatophyte moulds accounted for 15.51% cases while Candida species were 10.34%.

Conclusion:

Dermatophytosis is defined as the fungal infection of the skin, hair and nails by a group of keratinophillic fungi known as dermatophytes. This study is an attempt to find out various species of dermatophytes in clinically suspected cases of dermatophytosis found in elderly age group.

Table 1: Age and sex distribution of subjects (n=540)

Age group (years)	Male		Female		Total	
	No. (n)	Percentage (%)	No. (n)	Percentage (%)	No. (n)	Percentage (%)
60-64	82	15.18	150	27.77	232	42.95
65-69	121	22.40	55	10.18	176	32.58
70-74	44	8.14	32	5.92	76	14.06
75-79	48	8.88	2	0.37	50	9.25
>=80	6	1.11	0	0.00	6	1.11
Total	301	55.71	239	44.24	540	100

Table 2: Physiological skin changes among the subjects (n=540)

Physiological changes	Number (n)	Percentage (%)
Xerosis	302	55.92
Idiopathic Guttate Hypomelanosis	133	24.62
Wrinkling	437	80.92
Solar Lentigines	89	16.48
Senile comedones	57	10.55

Table 3: Physiological skin changes among the subjects (n=540)

Pathological changes	Number (n)	Percentage (%)
Benign tumors	244	45.18
Malignant tumors	4	0.74
Infestations	91	16.85
Drug reaction	3	0.55
Infections	229	42.40
Papulosquamous disorders	62	11.48
Bullous disorders	14	2.59
Psychocutaneous disorders	27	5
Vascular disorders	46	8.51
Pigmentary changes	65	12.03
Eczematous conditions	118	21.85
Miscellaneous	38	7.03

Table 4: Distribution of among the subjects (n=540)

Type	Disease	No. (n)	Percentage (%)
Bacterial	Leprosy	21	3.9
	Furunculosis	28	5.2
	Folliculitis	32	5.9
Fungal	Superficial mycoses	116	21.4
Viral	Herpes Zoster	21	3.9
	Warts	11	2.0
Total		229	42.3

Table 5: Clinical subtypes of superficial mycosis (n=116)

Fungal infection	No. (n)	Percentage (%)
Onychomycosis	29	25.00
Tinea Pedis	18	15.51
Tinea Manuum	17	14.65
Tinea Cruris	10	8.62
Tinea Corporis	9	7.75
Tinea Pedis + Tinea Unguium	12	10.34
Tinea Unguium + Tinea Manuum	4	3.44
Pityriasis versicolor	17	14.65

Table 6: Fungal isolates (n=116)

Fungal isolates	No. (n)	Percentage (%)
T. rubrum	32	27.58
T. verrucosum	20	17.24
T. mentagrophytes	26	22.41
T. schonlenii	5	4.31
T. tonsurans	2	1.72
E. floccosum	1	0.86
Candida sps.	12	10.34
Non-dermatophytes	18	15.51

Figure 1: SDA (*Growing Aspergillus Niger*)

Figure 2: SDA with cycloheximide (*Growing Trichophyton Rubrum*)

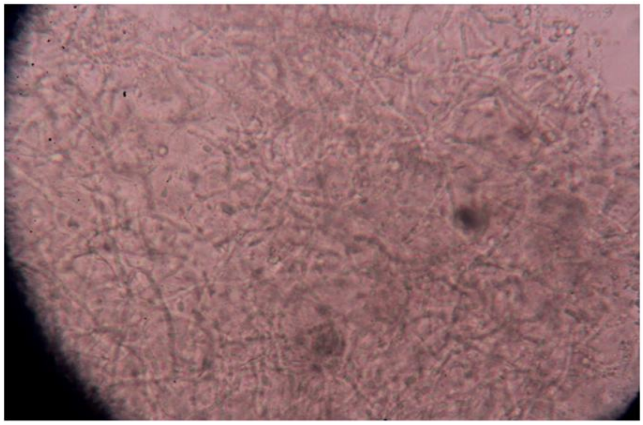

Figure 3: 10% KOH showing numerous spores and hyphae

Figure 4: Total Dystrophic Onychomycosis

References:

1. World health organization. South East Asia. Programs and project. 2016. Available at: http://www.searo.who.int/entity/health_situation_trends/data/chi/elderly-population/en/. Accessed on 14 October 2016.
2. Rajan SI, Sharma PS, Mishra US. Demography of Indian aging,2001-2051. J Aging Social Policy. 2003; 15:11-30.
3. Noa S. Scheinfeld. Skin Disorders in Elderly Persons: Identifying Fungal Infections. Infect Med. 2007;24:509-515
4. Gérald Piérard. Onychomycosis and Other Superficial Fungal Infections of the Foot in the Elderly: A Pan-European survey. Clinical and Laboratory Investigations in Dermatology 2001;202:220–224
5. Hay RL, Ashbee RH. Fungal Infections. In: Griffiths CEM, editor. Rook's Textbook of Dermatology. 9th ed. New Delhi: Wiley-Blackwell; 2016. pp. 32.1–55.
6. Brodell RT, Elewski B. Superficial fungal infections. Errors to avoid in diagnosis and treatment. Postgrad Med. 1997;101:279-287.
7. Loo DS. Onychomycosis in the elderly: drug treatment options. Drugs Aging. 2007;24:293-302.
8. Tan JS, Joseph WS. Common fungal infections of the feet in patients with diabetes mellitus. Drugs Aging. 2004;21:101-112.
9. Weinberg JM, Scheinfeld NS. Cutaneous infections in the elderly: diagnosis and management. Dermatol Ther. 2003;16:195-205.
10. Weinberg JM, Vafaie J et al. Skin infections in the elderly. Dermatol Clin. 2004;22:51-61.
11. Sheethal MP, Shashikumar BM. A cross-sectional study on the dermatological conditions among the elderly population in Mandya city. Int J Med Sci Public Health. 2015;4:467-70.
12. Grover S, Narasimhalu CV. A clinical study of skin changes in geriatric population. Indian J of Dermatol Venerol Leprol. 2009;75:305.
13. Raveendra L. A Clinical Study of geriatric dermatoses. Dermatologia Online. 2014;5(3).
14. Jindal R, Jain A, Roy S, Rawat SD, Bhardwaj N. Skin disorders among geriatric population at a tertiary care center in Uttarakhand. J Clin Diagn Res. 2016;10:6.