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Clinico -Mycological study of Dermatophytoses at a Tertiary care Hospital in Nandyal, AndhraPradesh, India.

P.Prasanna vijaya kumari [1], Swetha.k[1], S.N.Sireesha[2], S.Sreedevi[2].
[1]*Department of Microbiology, Santhiram Medical College,Nandyal,A.P,India.*

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ABSTRACT:
Dermatophytoses is the condition which causing the Superficial Skin Infections caused by fungal agents ,worldwide.These infections commonly occurs in hot and humid conditions.Three Genera mainly causes these infections ,those are Trichophyton,Microsporum and Epidermophyton.. The present study was done to assess the clinical profile of the dermatophytic infections and also identify the fungi upto the species level in our Geographical area .In my study 80 samples were included which consists of Skin scrappings,Nail clippings and Hair follicles.Samples were collected from patients presenting with different types of fungal infections.Samples were collected using standard techniques, and samples were processedby doing Direct microscopy in(10%,20%,40%) potassium hydroxide(KOH) and culture onSDA and DTM,and identified the organism up to the species level. In this studyGenusTrichophyton was identified in 98%(43/44) of samples, Genus Microsporum were detected only in 2% samples.In these Trichophyton mentagrophytes was the most predominant organism(81.8%) , next followed by Trichophyton rubrum (11.36%) .In tinea infections Tinea corporis was the most frequently implicated clinical condition followed byTinea cruris.These infections predominant in Low socio economic group, occupation of construction work which leads to un hygienic conditions, may favours these infections.

KEYWORDS: Super ficial mycosis, Dermatophyte,Trichophyton, Microsporum, Tinea.

I. INTRODUCTION:

In the fungi, Dermatophtes are the fungi who produces proteases enzymes that which digest the Keratin and allow for colonization, invasion and infection of the Stratum corneum of the skin ,nail clippings and hair shaft.These Dermatophytes mainly belongs to the three Genera of fungi,those areTrichophyton ,Microsporom and Epidermophyton.These organisms mainly causes infections in the Cutaneous and only in the Nonliving cornified layers ,why because these fungi don't have the ability to penetrate thedeeper tissues or organs.The infections caused by these are termed as ring worm or"Tinea".Based on the location of the lesions on the body the nomenclature of tinea was done,eg; tinea capitis refers to ring worm infection of the Head region.These Tinea infections are more common in tropical and subtropical areas including India.In this area heat,humidity,moisture plays key role.In Asia ,Trichophyton rubrum andTrichophyton mentagrophytes are the predominantly isolated organisms.Even in India also Dermatophytoses is mostly caused by the factors of poor hygienic,poverty,and overcrowding like social conditions.

Clinical lesions caused by these fungi are closely resemble and highly variable with other skin diseases.To differentiate them making of laboratory diagnosis and confirmation is needed.The important predisposing factors for these Dermatophytoses are Uncontrolable use of steroids,Non-compliance to treatment ,Irrational use of antifungals,sharing of clothes,geographic locationpredisposing to heat,humidity andincreased sweating,obesity,other conditions like Diabetes,Immunosuppressionand Atopy.In ChronicDermatophytosis Trichophyton rubrum is the most commonest causative organism.These fungal infections occurs frequently due to the dermatophytes has been noticed in our region of Nandyal Area.The present study was done to assess the clinical and epidemiological profile of Dermatophytic infections, to identify the fungi upto species level and to compare the clinical diagnosis with potassium hydroxide(KOH),smear positivity and culture positivity.

II. MATERIALS AND METHODS:

The study population included in the study were80 patients who were clinically suspected of Dermatophytoses.The patients presented to the Dermatology outpatient department of Santhiram Medical College and General Hospital,Samples during were Included in this study. was collected from January 2022 to August 2022.A detailed clinical history findings includes age ,sex ,socioeconomic status,occupation,duration of

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disease,history of recurrence and type of lesion,similar complaints in the family and contacts with animals and soil were elicited and recorded in all cases.Patients of all age groups and the both the sexes were included.The exclusion criteria wereuse of Antifungal therapy(orally as well as topical)in the previous Three months,immunocompromised state,secondarily infected,those who had taken other modality of treatment like steroids and presence of serious underlying systemic disorders are excluded.

The patients were classified according to the site of involvement; these conditions includedTinea corporis, T.capitis,T.cruris, T.pedis, T.unguium andT.mannum.For obtaining the samples aseptically, the infected areas or lesions were wiped with70% ethanol to remove the dirt and environmental contaminants. Skin scrapings were collected from advancing margins of the lesions, Hair stubs are collected by plucking of hair including the Roots, and Nails are collected as clippings. These all are collected in the sterile plastic containers with the help of sterile scalpel/tweezers.10%KOH solution was used for skin scrapings and 20%KOH was for Hair samples, 40% KOH was used for Nail samples.

All preparations were examined under low power and confirmed under high power. The positive samples were processed for isolation of the Dermatophyte species on Sabouraud"s Dextrose agar (SDA.HIMEDIA) and Dermatophyte test media (DTM, used as selective media)containing cycloheximide (0.05%) andchloramphenicol (0.004%) under sterile conditions. The SDAand DTM slants were incubated at 30^{O}C for Four weeks and monitored for the growth. The colonies on the slants were examined for their morphology,texture ,pigmentation.Examination using Lacto phenol Cotton Blue(LPCB) staining wasdone for every specimen which shown growth and observed under low(10xlens)as well as high power(40xlens) of Light microscope. The identification was based on features such as organization of hyphae those are pencil shaped, drop like, spherical, in bunches etc.

III. RESULTS:

Out of 80 samples isolated72(90%) were Skin scrapings, 07(8.75%) were Hair stubs and 01(1.25%) was Nail clippings .On cultural examination, 44(55%) were found positive for dermatophyte species (Table. 1 and Chart .1).Among different Tineaconditions, Tinea corporis 18/44(40.9%) figured at the top followed by Tinea cruris14/44(31.81%) and Tinea pedis7/44(15.9%) for culture positivity.

Genus Trichophyton were found in97.7 %(43/44) cases while Genus Microsporum was detected only in 2.27 %(1/44) cases.However, none of theGenusEpidermophyton was recovered in my study.Among the GenusTrichophyton ,T.mentagrophytes was the predominant organism(83% cases) followed byT.rubrum(11%cases).The identification of these Dermatophyte species was based on cultural characteristics,growth rate,texture,colony size and pigmentation produced on obverse and reverse sides of SDA slants.

T.mentagrophytes grew rapidly (3-5 days), on cream to white on obverse and yellow to brown on reverse. On microscopic examination, well septate hyphae with numerous spherical microconida were visible.Spiral hyphae were seen T.rubrum ,itgrew relatively slower(10-15 days), the growth was powdery to velvety with reddish tinge on obverse.Well septate pencil shaped hyphae with numerous spherical microconida along with macroconida were visible on microscopic examination. .M.gypceum grew rapidly (3-5 days), the growth was powdery to granular with rosy pink on obverse and yellow to brownish on reverse on microscopic examination, .Septate hyphae, rough thick walled macroconidia with rounded ends and 4-6 compartments were seen. T.mentagrophytes, the predominant species isolated was found mainly with Tinea corporis(15/36)41.6% and Tinea cruris (12/36)33.33%.However it was seen in all other Tinea conditions also except T.marinum.

Among the total number of cases, 79.55% were of Males and 20.45% were of Female patients .In this positive samples ofMale are, 35(79.55%) and Female are 9(20.45%).It was also observed that 70.45% patients fell in the age group of 20-50 years while 36.36% patients fell in the age group of 1-20 years and 11.36% patients were in the age group of >50 years respectively.

The present study highlights the clinical pattern and prevalence of different Dermatophyte species implicated in different Tinea infections in and around Nandyal city of Andhra Pradesh.

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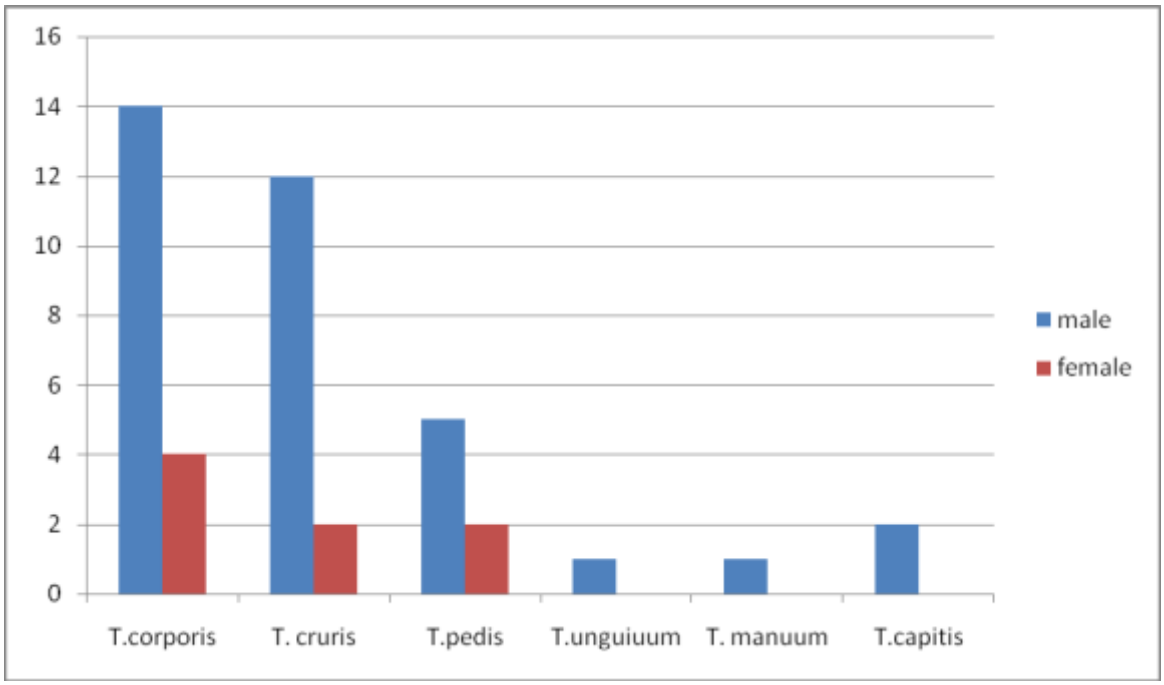
Chart.1 Details of culture positive samples recovered from patients with different ring worm infections:



Tinea infection	**Samples examined no's**			**KOH positive samples**	**No of positive samples**		
(Types)	Total	Male	Female		Total	Male	Female
T.corporis	32	24	8	32	18	14	4
T.cruris	24	20	4	24	14	12	2
T.pedis	15	13	2	15	7	5	2
T.unguium	1	1	0	1	1	1	0
T.manuum	1	1	0	1	1	1	0
T.capitis	7	4	3	7	3	2	1
Total	80	63	17	80	44	35(79.55%)	9(20.45%)

Table.2:Association of dermatophyte species with different Tenia condition.

Dermatophyte .sp	**T.corporis**	**T.cruris**	**T.pedis**	**T.unguiuum**	**T.manuum**	**T.capitis**	**Total 44**	**%**
T.mentagrophytes	15	12	6	1	nil	2	36	83

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T.rubrum	2	2	1	nil	nil	nil	5	11
T.tonsurans	nil	nil	nil	nil	nil	1	1	2
T.verucosum	nil	nil	nil	nil	1	nil	1	2
M.gypseum	1	nil	nil	nil	nil	nil	1	2

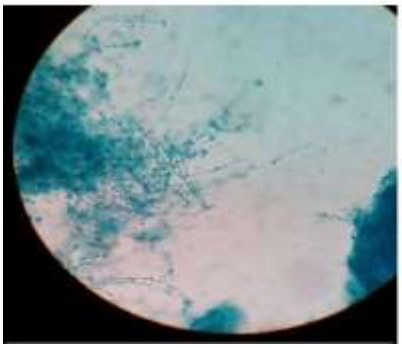
species wise:

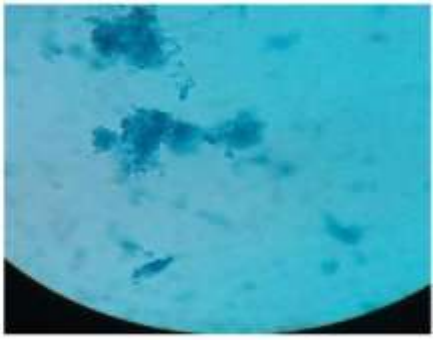
Table.3: Details of sex and age group of patients of dermatophytosis examined:

Male patients			Female patients			Distribution of culture positive patients in age groups					
Total	Culture positive	%Percentage	Total	Culture positive	%Percentage	1-10 years	11-20years	21-30yrs	31-40yrs	41-50yrs	>50yrs
63	35	55%	17	9	53%	M-6 FM-3	M-5 FM-2	M-9 FM-4	M-8 FM-5	M-3 FM-2	M-4 FM-1
Total						9	7	13	13	5	5

Fig:1;clinical pictures of Tenia infections:

Fig.2. Microscopic pictures of the fungal organisms:





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IV. DISCUSSION:

The climate in Nandyal remains hot and humid for major part of year which is favourable for growth of dermatophytic fungus.

Not only the climatic conditions favourable for the growth of dermatophytes, other factors such as overcrowding, unhygienic life style of the community with low socio-economic background were also the contributing factors for the development of dermatophyte infections in this area.. The study population contains primarily of farmers and construction workers.

In this study total 80 cases of superficial skin infections examined, only 44 (55%) were culture positive. Although patients of all ages were susceptible to dermatophytosis, most (64.9%) belonged to the age group of 21– 50 years as reported by other researchers[1,3,5,10].The present study correlates with the study of Agarwal U.S.et al[1] and Bhatia V.K. and Sharma et al[3,5.]

The probable reason for higher prevalence in this group could be that the individuals in this group are often most active because of their involvement in the outdoor physical activities. Out of the total positivecases, 79.54% were males (Table 1). Such higher prevalence in males has been reported in other parts of India as well as other countries of the world by several researchers[1, 3, 4, 8]. This may be due to increased physicalactivity and increased opportunity for exposure in men than women. This reason correlates with study of Bhavsar H.K et al[4] and Gupta M Sarma N.L et al[8] with my study.

Tinea corporis was the most common clinical condition observed in various exposed parts of the body and next are followed by tinea cruris in which groin and surrounding areas are affected. The clinical picture of these conditions is presented through Figure 1. Similar observations have been made by other researchers study Das K.Basak.S ray et al[7].

Tinea conditions are consequence of exhaustive physical work and prolonged exposure to sun leading to excessive sweating. Among the females who had tinea corporis, common site involved was the waist area due to the patterns of clothing worn by the women like the saree and salwar suits which act as precipitating factors due to friction, increased sweating, collection of dust particles and fungal spores at belt line. In addition, the tight fittings and synthetic clothing particularly in males provide damp, sweaty and warm skin conditions. All these factors favour the growth of dermatophytes,All these factors correlates with other researchers study like Mathur. M .Kedia .S.K,and Ghimare RBK et al[11] .Tinea pedis and Tinea unguium might result from wearing of socks and shoes for a long period providing damp conditions especially in inter-digital spaces.

In the present study, T. mentagrophytes was the predominant dermatophyte (83%) involved followed by T. rubrum (11%). This finding is contrary to the observations of others in which a reverse trend has been reported. This could be due to the fact that T. rubrum is generally linked to chronic dermatophytosis. Therefore, the low proportion of T. rubrum might be involved in acute superficial mycosis. Also, as this organism is a slow growing organism, there is a possibility that other dermatophyte species might overgrow or mask the growth of T. rubrum during the isolation. Microsporum gypseum was involved in (2%) cases only. We, could notfound any involvement of Epidermophytonspp in my study. Tinea corporis and Tinea cruris were the most common clinical types.These findings of mine correlates with other researchers study like Pandey A.Pandey.M et al[12], Kanwar A.J, Mamta Chander et al[13].

Although, the present study is a random study that focuses primarily on the prevalence of different dermatophyte species in a small area in the Nandyal city, more systematic study covering larger population and over a longer period of time would give a better insight into the epidemiology of dermatophytosis in this area..By doing PCR amplification from the samples we may get good results, but Molecular methods were not included in our study because of the resources limitation.

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