

Tinea Infection, an Encumbrance of the Year

Dr Avinash Shankar¹, Dr Amresh Shankar², Dr Anuradha Shankar³

¹MD (Internal Medicine); DNB (E&M), Postgraduate in Endocrinology & Metabolism (AIIMS-Delhi),
Chairman, National Institute of Health & Research, Warisaliganj (Nawada) Bihar, 805130, India

²BAMS (BRABU); MHA, Medical Officer, Bihar state Health Services, Director (Hon), Aarogyam
Punarjeevan, Ram Bhawan, Ara Garden Road, Jagdeopath, Baily Road, Patna 14

³BAMS (BRABU), Director, Centre for Indigenous Medicine & Research, RA. Hospital & Research
Centre, Warrisaliganj (Nawada) Bihar, 805130

***Corresponding Author:** Dr Avinash Shankar, MD (Internal Medicine); DNB (E&M), Postgraduate in
Endocrinology & Metabolism (AIIMS-Delhi), Chairman, National Institute of Health & Research,
Warisaliganj (Nawada) Bihar, 805130, India

Abstract: Dermatophytosis remain prevalent during 2016-2017 with recurrence or persistence in all the screened 3290 cases of either sex with male predominance and common among age group 25-40 years in spite of use of topical and oral available antifungal therapeutics, being considered as a result of increasing self-medication, drug misuse, climatic variation causing emergence of resistance to antifungal drug and decline in cell mediated hypersensitivity response to dermatophyte.

Keywords: dermatophyte, drug resistance, self-medication, cell mediated hypersensitivity response)

1. INTRODUCTION

Fungal infection of skin, a common agonising presentation of the year 2016-2017 and proved to be an year of fungal infection outbreak, as attendance of patients presenting with agonising itching increasing in geometric progression may be due to increased self-medication, use of OTC product and seasonal variation which prompted ecological alterance feasible for fungal growth and emergence of resistant fungal strain to commonly used antifungal agents both topical and oral. Fungal dermal infection affect all age group and both sexes.^{1,2}

Thus with an intent to know the reason of this increasing incidence and non-response to commonly used therapeutics, patient attending at MOPD of RA Hospital & Research Centre, Warisaliganj (Nawada) Bihar and Aarogyam Punarjeevan, Ara Garden Road, Jagdeo path Baily Road Patna 14 been screened.

2. AIMS AND OBJECTIVES

To ascertain the cause of increasing incidence of tinea infection and failure of conventional oral and topical antifungal drugs.

3. MATERIAL AND METHODS

Cases suggestive of fungal dermal infection either fresh or cases taking treatment without any response been selected, interrogated, for the disease onset, duration, complaints, treatment, onset, duration, complaints, treatment taken and their outcome. History of immunosuppressive or immune compromise state, HIV or Diabetes mellitus

Each patient dermal sample been evaluated for typing of the lesion and culture and sensitivity to know the pattern of effective antifungal drugs.

Dietary history, profession, personal habits were also elucidated to analyse the data and ascertain the factor responsible for persistence or recurrence of the lesion.

Method of Sample Collection: ^{3,4}

Infected area wiped with 70% Ethanol skin scrapping ,kept in sterile plastic container (Sterile Uricol,Himedia)

Examination of KOH Mount:

Sample(scrap) treated with 40% KOH for 10 minutes on a glass slide and examined under microscope for presence of fungi under low power magnification)

Positive sample were processed for the isolation of Dermatophytes on Sabourds dextrose agar (SDA, Himedia).

Urease Test: to determine the dermatophyte species .

Polymerase Chain Reaction (PCR) for fungal DNA

4. OBSERVATION

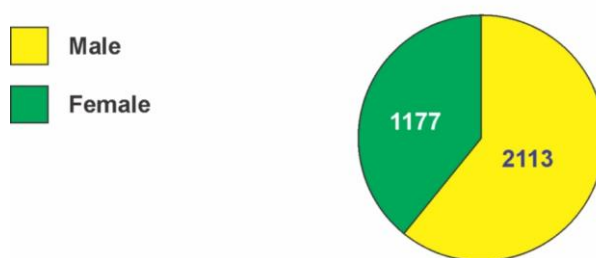
Selected patients were of age <5 yrs to >55 yrs and majority were of age group 25-40 years

Table1. Shows distribution of patients as per part involved, age and sex

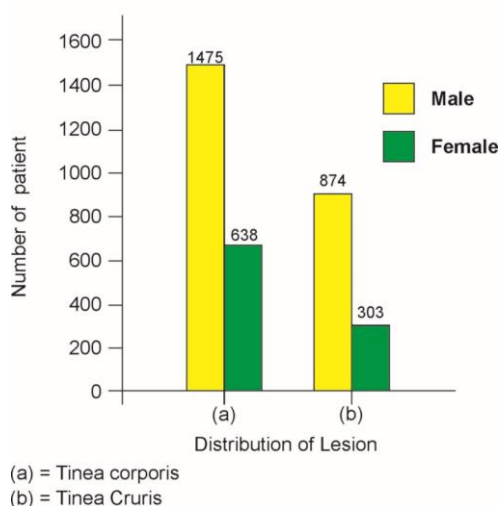
Age group	Tinea M	Corporis F	Total	Tinea M	Crura F	Total
< 5	18	16	34	11	02	13
5-10	27	22	49	09	08	17
10-15	30	29	59	14	08	22
15-20	80	58	138	24	14	38
20-25	157	89	246	52	20	72
25-30	208	131	339	109	79	188
30-35	199	143	342	99	38	137
35-40	312	150	462	120	41	161
40-45	89	56	145	52	22	74
45-50	81	40	121	30	20	50
50-55	76	50	126	45	20	65
>55	198	90	288	73	31	104

Out of all 2113 were male and 1177 were female (Pie diagram) and 2349 and 941 were of Tinea Corporis and Tinea Crura respectively (Bar diagram)

Pie diagram Showing Male Female composition



Bar diagram as per distribution of infection



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Out of all 93.86% (3088) patient were KOH positive, 94.9% (3120) were urease positive while all 3290 cases shows DNA positive for dermatophyte

Table2. Showing diagnostic study

Diagnostic parameters	Number of patients				Total
	Tinea corporis		Tinea cruris		
	Male	Female	Male	Female	
KOH staining:					
Positive	1390	598	804	296	3088
Negative	85	40	70	07	202
Urease:					
Positive	1396	600	824	300	3120
Negative	79	38	50	03	170
PCR:					
Positive	1475	638	874	303	3290

31.61% patients were suffering with agonising presentation since <1 yr while 5.7% (186) cases since >5 years (T-3)

Table3. Showing duration of illness

Duration of illness (in years)	Number of Patients				Total
	Tinea corporis		Tinea cruris		
	Male	Female	Male	Female	
<1	418	209	312	101	1040
1-2	339	148	194	70	751
2-3	276	136	129	50	591
3-4	186	68	145	42	441
4-5	132	57	60	30	279
>5	124	20	34	10	18

Out of all 28.8% (948) had taken all sorts of topical and oral antifungal and their combination while other major group 18.2% (600) has used only topical application.

Table4. Showing distribution of patients as per therapeutic status

Therapeutic used	Number of Patients		
	Tinea corporis	Tinea cruris	Total
Only topical application Clotrimazole topical+	400	200	600
Fluconazol Oral Clotrimazole topical +	294	140	434
Itraconazol oral Terbinafin topical +	272	114	386
Fluconazol Oral Terbinafin topical +	184	121	305
Itraconazol oral Topical coal tar & Salicylicacid +	201	101	302
Fluconazol/itraconazole	292	103	395
Taken all shorts of topical And oral	550	398	948

5. RESULT

Out of all screened cases of Tinea having used majority of available antifungal drug both oral and topical, but all presented with recurrent dermal infection.

6. DISCUSSION

Infection of keratinised tissue is caused by various fungi species and is assuming greater significance due to excess use of immunosuppressive drugs and self medication and commonest fungal infection is referred as Ring worm due to its ring like appearance and named as per part involved.

Though this infection is prevalent globally, more common in tropical area and reaches epidemics in area with higher humidity, over population and poor hygiene. Hot and humid climate prompts dermatophyte infection.^{5,6}

Commonly used drugs Fluconazol, Itraconazol, Terbinafin both as oral and topical and Clotrimazole as topical was quite in vogue, though topical agents like tolnafate, Salicylate and others are in use but non ensured cure except transient relief

In spite of use of available various therapeutics both topical and oral persistence or recurrence of dermatophyte infection in screened 3290 cases with male predominance and commonly affected age group 25-40 years, were positive for DNA typing of fungal infection, KOH staining and urease test.

Topical Azole inhibits Lanosterol-14 alpha demethylase, the enzyme CytP450 dependant enzyme convert Lanosterol to Ergosterol make the fungal cell membrane unstable and cause membrane leakage

While Allylamine (Terbinafin) inhibit Squalene epoxidase which converts Squalene to Ergosterol and cause fungal cell membrane leakage

These drugs bind effectively to Stratum corneum due to its depolarising nature and penetrate deep to hair follicles.

AZOLE -----(-) Lanosterol 14 alpha demethylase (CytP450 dependant enzyme)

Lanosterol ----->Ergosterol

Causes fungal membrane unstable

Allylamine-----(-) Squalene Epoxidase

Squalone -----> Ergosterol

Membrane leakage

(Figure showing Biokinetics of antifungal resistance)

Thus the observation can be explained as ^{7,8} –

- Male predominance may be due to increased out door exposure and more physical work leading to increased sweating synergized with less cosmetic concern than female.
- Secondly predominance dermatophyte infection among adult age group is due to increased level of physical activity and favors dermatophyte growth. In addition tightly worn synthetic cloths also causes localized humidity and body temperature facilitate suitable environment for dermatophyte growth. But in hard working female the incidence is at par with male.
- Chronicity and persistence of the infection is considered due to decreased cell mediated immunity and delayed hypersensitivity response to dermatophyte antigen and emergence of cross resistance to varied topical and oral antifungal.

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