Chapter: One

Introduction

1.1 Introduction:

Dermatophytes are fungi that invade and multiply within keratinized tissues (skin, hair, and nails) causing infection. Based upon their genera, dermatophytes can be classified into three groups: Trichophyton (which causes infections on skin, hair, and nails), epidermophyton (which causes infections on skin and nails), and Microsporum (which causes infections on skin and hair). Based upon mode of transmission, these have been classified as anthropophillic, zoophilic, and geophilic. Finally, based upon the affected site, these have been classified clinically into tinea capitis (head), tinea faciei (face), tinea barbae (beard), tinea corporis (body), tinea manus (hand), tinea cruris (groin), tinea pedis (foot), and tinea unguium (nail). Other clinical variants include tinea imbricata, tinea pseudoimbricata, and Majocchi granuloma[3].

Despite the increasing prevalence of cutaneous dermatophytosis across the world, and especially in tropics, research in this area has often been neglected. In fact, one has to go back nearly two decades to find guidelines on the management of tinea corporis and cruris (by the American Academy of Dermatology) and these at best, appear inadequate in today's world. The more recent guidelines published by the British Association of Dermatology and in the British Medical Journal have largely focused on tinea capitis and tinea unguium with scarce reference to tinea corporis/cruris. Updated Cochrane reviews on the use of topical therapy in tinea corporis, cruris, and pedis, and few on oral therapies have helped to bridge this knowledge gap but still well-designed trials, national and/or international evidence-based guidelines and recommendations on the dose and duration of the use of systemic antifungals in tinea corporis/cruris are conspicuous by their absence. The present review aims to revisit this important topic and will detail the recent advances in the pathophysiology and management of tinea corporis/cruris[1].

Tinea is a superficial fungal infection caused by dermatophytes which invade and multiply within the keratinized tissue (skin, hair, nails). Approximately 20%-25% of the world population is affected by tinea. There is a rise in the prevalence in recent years especially in the tropical countries along with an increase in the number of chronic and

recurrent dermatophytosis. There is a huge gap between the treatment required in the present scenario and the treatment guidelines given in the standard books[2].

There is a paucity of original studies especially in India depicting dermatophytosis becoming a huge menace both to the patient and to the treating physician. Terbinafine is a fungicidal drug and acts by inhibiting the enzyme squalene epoxidase which converts squalene to lanosterol. Itraconazole is basically a fungistatic drug that acts through inhibition of the enzyme 14α-demethylase. Many dermatologists have started using higher doses and combination regimens of antifungals to counter this problem. However, such regimens have not been validated. Hence, in this study we decided to evaluate the commonly used systemic antifungal drugs, i.e., terbinafine and itraconazole, at various doses and in combination[2/3].

Oral terbinafine 250 mg/day is effective in the treatment of superficial dermatophyte infections such as onychomycosis, tinea pedis and tinea corporis/cruris

1.2 Overview of Dermatophytosis

Definition

Dermatophytes are a common label for a group of fungus of Arthrodermataceae that commonly causes skin disease in animals and humans. Traditionally, these anamorphic (asexual or imperfect fungi) mold genera are: Microsporum, Epidermophyton and Trichophyton. There are about 40 species in these three genera. Species capable of reproducing sexually belong in the teleomorphic genus Arthroderma, of the Ascomycota. Dermatophytes cause infections of the skin, hair, and nails, obtaining nutrients from keratinized material. The organisms colonize the keratin tissues causing inflammation as the host responds to metabolic byproducts. with clinical cure, whereas the lack of or a defective cell-mediated immunity predisposes the host to chronic or recurrent dermatophyte infection[3].

Disease burden

Dermatophytosis infections are the common fungal infections aggravated by hot and humid climate. In a hot and humid country like India, the prevalence of superficial

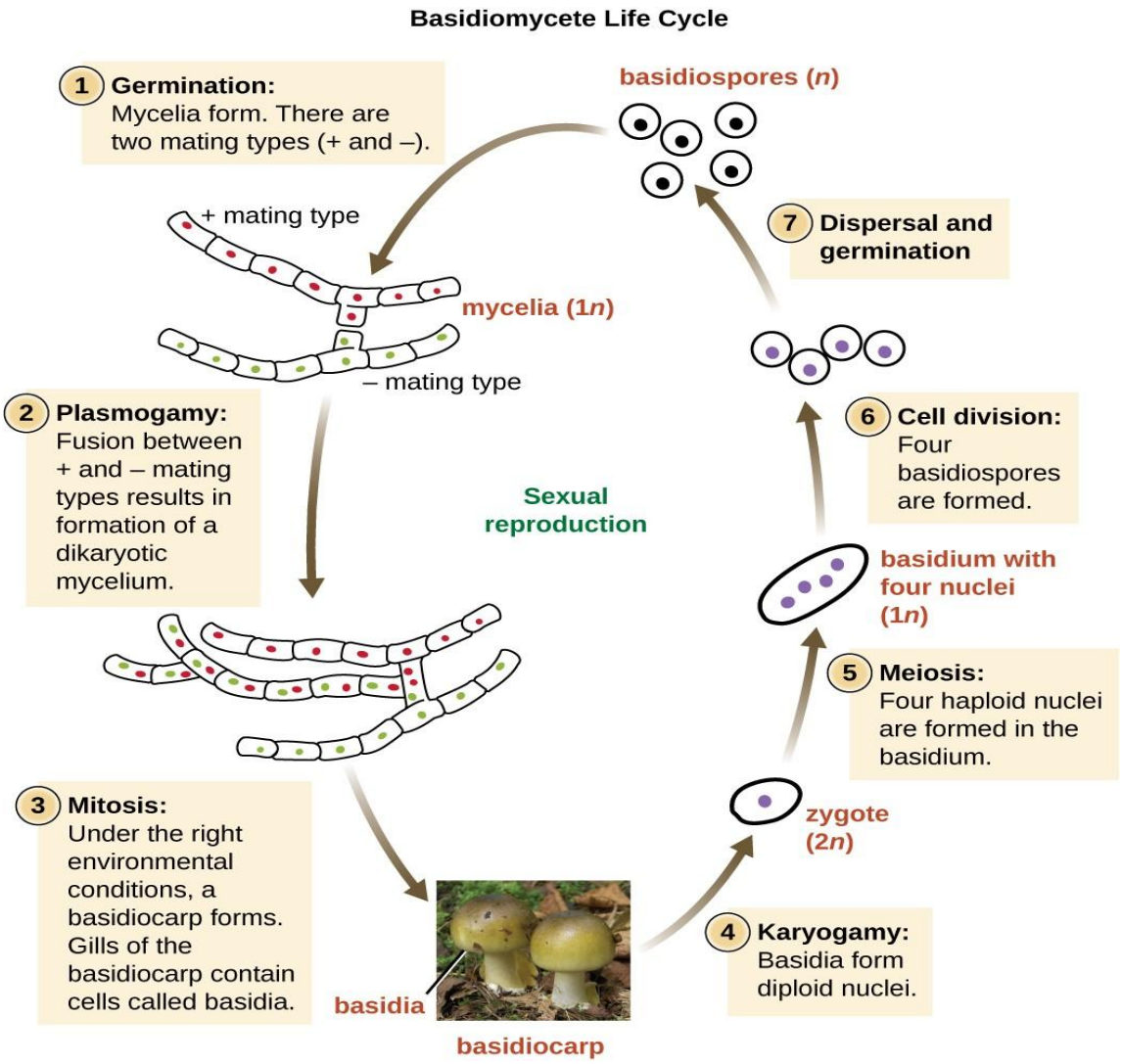
mycotic infections is on the rise due to contributing environmental and demographic factors. Dermatophyte infections contributed to over half of all fungal disease outpatient visits in the United States and led to estimated costs totaling up to $802 million in 2017. The immense burden of fungal skin diseases must be considered in health policy decisions to improve population health and quality of life[4].

Distribution

In these days of rapid transit from continent to continent, and the increasing mobility of people, agents of disease are no longer geographically restricted. Disease contracted halfway across the world may become manifest in a country in which the pathogen is not normally found. Thus, knowledge of the geographical distribution of pathogens becomes increasingly important when a diagnosis is being made[5].

Causes

Dermatophytes are fungi that require keratin for growth. These fungi can cause superficial infections of the skin, hair, and nails. Dermatophytes are spread by direct contact from other people (anthropophilic organisms), animals (zoophilic organisms), and soil (geophilic organisms), as well as indirectly from fomites[6].



Fungi | Microbiology

Transmission

Dermatophytes can survive solely on outer cornified layers of the skin. The ability of certain fungi to adhere to particular host arises from numerous mechanisms and host factors, including the ability to adapt to the human body. Natural infection is acquired by the deposition of viable arthrospores or hyphae on the surface of the susceptible individual. After the inoculation in the host skin, suitable conditions favor the infection to progress through the stages of adherence and penetration. Development of host response is mostly by a T-cell mediated response of delayed-type hypersensitivity.

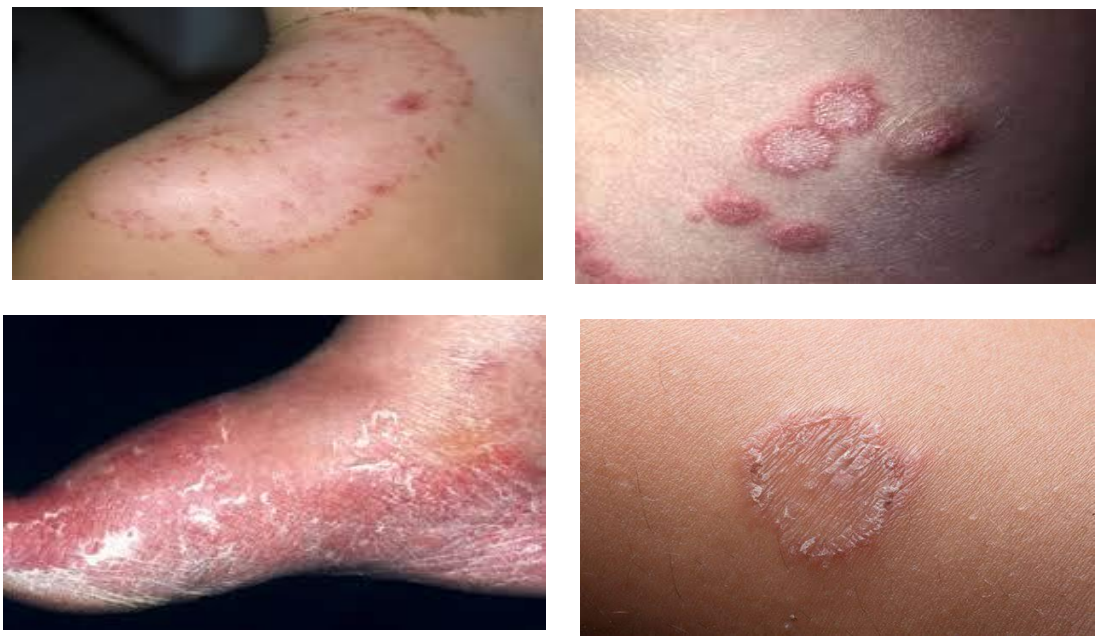
Antibody formation does not seem to be protective. Natural defenses against dermatophytes depend on both immunological and nonimmunological mechanisms[7].

Pathophysiology

Dermatophyte infections are among the most common infections encountered in medicine. Often considered trivial, these infections are in fact frequently refractory and recurrent. This article presents an overview of the causes, symptoms, differential diagnosis, and clinical course of the most prevalent dermatophyte infections: tinea pedis, tinea cruris, tinea capitis, tinea corporis, and onychomycosis. Complicated situations such as follicular involvement, dermatophytosis in patients who are immunocompromised, and the exaggerated response to zoologically acquired fungal infections are also discussed[5].

Signs and symptoms

Red, scaly, itchy or raised patches. patches may be redder on outside edges or resemble a ring. Patches that begin to ooze or develop a blister. Bald patches may develop when the scalp is affected. Nails may thicken, discolor or begin to crack.



Dermatophytosis Images

Diagnosis

The first step for testing for dermatophytes is to first investigate whether an antifungal agent has already been used to treat the patient. Since an important step in testing for a dermatophyte is culturing the organism, it is useful to know if treatment may preclude growth of the organism. If a topical antifungal has been utilized, it is suggested to wait 14 days until trying to culture. The next step is to prepare the sampling area by disinfecting the region that you will be sampling with 70% ethanol. For hair samples, it is best to use sterile forceps to pull out 10 to 12 hairs near the root such that the follicle can be tested. Select hairs that appear damaged or utilize a Wood's lamp to identify fluorescing hairs as these can indicate infection. Scrape skin with a scalpel or glass slide at the leading edge or the area that looks most recently affected. The centers likely only contain nonviable organisms and are not useful for culture. For nails, clip or scrape the underside of the nail, getting near as possible to the nail bed. All collected material should be placed in a sterile envelope or container. These specimen types are stable at room temperature for several days. Do not refrigerate, because dermatophytes are sensitive to cold temperatures[8].

Lab identify a dermatophyte - Microscopy

The first tool that microbiologists can utilize to ask the question, "Is this a fungal infection?", is by direct visualization of the microorganism through microscopy. Samples must first be processed in order to digest keratinized and proteinaceous material that prevents visualization and staining of fungal elements. This is typically done with Potassium Hydroxide or KOH, but sodium hydroxide can also be used. Depending on the specimen, this step can be done at room temperature or by slightly heating to enhance the digestive process. The time is also variable, for instance, it takes less time to digest skin than nails. Next, a stain is used to enhance visualization. There are several options available, but the most common is calcofluor white, examples of this fluorescent stain are below. This stain binds preferentially to chitin, a component of fungal cell walls. The slides are viewed under a fluorescent microscope and scanned for evidence of a fungal infection. The images below show a positive KOH from a skin scraping and you can see several examples of hyphal elements fluorescing. Septations, or the divisional lines between fungal cells, are visible, and the white arrow is pointing to an area of branching. Since molds can take several weeks to grow, this quick tool is very useful to the clinician and could aid in quickly guiding treatment. However, it is not

possible to identify the microorganism to the genus and species level through this method of examination[9].

Management

Superficial mycosis is estimated to be one of the most prevalence infections, affecting roughly quarter of the world's population. Among the various classes of cutaneous mycoses, dermatophytes are the most common causative agents. Generally referred to as ringworm or tinea, this specific group of dermatophytes include the genera Microsporum, Trichophyton and Epidermophyton. Transmission of this disease occurs either by direct contact

With infected humans or animal or indirectly by contact with contaminated fomites. Incidence of dermatophytosis in India ranges from 36.6% to 78.4% due to the high temperature and humidity that contributes to excess sweating, maceration, and alkaline pH; these environmental factors are ideal for the keratinophilic fungi. Hence, certain parts of the body, namely intertriginous areas (web spaces and groins) are more susceptible to the infections since they provide favorable media for the fungi to grow. Despite being a superficial and largely painless, tinea can also invade deeper into the tissues and cause a disseminated infection, depending on the host's immune status and hence the disease should not be neglected. The presentations and severity of tinea is dependent largely on the host's immune status. Diseases such as diabetes mellitus, lymphomas, Cushing's syndrome as well as old age compromise a person's immunity and can result in severe and widespread dermatophytosis. True to its more common name, ringworm, this cutaneous fungal infection has a classical appearance of a central clearing that is surrounded by an active border of redness and scaling. When present in the inguinal region, this disease presents as bilateral, dull red, pruritic plaques that have prominent scaly edges and minute papules or pustules at their margins. Traditionally, azole antifungals mostly used for dermatophytosis sometimes combination drug are most effective[9].

Terbinafine

Terbinafine is an allylamine medicine used to treat fungal infections. It is especially effective against dermatophytes (tinea infections). It is available as 250 mg tablets

Pharmacology

Terbinafine is highly lipophilic and tends to accumulate in hair, skin, nails, and fat cells. This accumulation results in therapeutic levels of terbinafine even after 80 days following one week treatment of 250 mg/day. Terbinafine is well absorbed after oral administration, but it undergoes significant “first-pass” metabolism and its resulting apparent bioavailability is only 45%. It is metabolized to ten metabolites by at least seven different CYP enzymes, the most important apparently being CYP2C9, CYP1A2, and CYP3A4.[10]

Mechanism of Action

Terbinafine causes fungal cell death by inhibiting squalene epoxidase, the main enzyme in sterol biosynthesis, resulting in ergosterol deficiency within fungal cell walls. It has fungicidal activity against dermatophytes & some yeast

Indication

- Onychomycosis. Indicated for onychomycosis of the toenail or fingernail owing to dermatophytes
- Tinea Pedis (Off-label)
- Tinea Corporis, Tinea Cruris (Off-label)
- Sporotrichosis, Lymphocutaneous and cutaneous (Off-label).

Adverse Effect

There are some contraindications for itraconazole use. The main one being heart failure or a history of heart failure due to itraconazole’s potential cardiotoxic effects. Another contraindication is liver failure or disease because itraconazole can cause hepatotoxicity. Itraconazole is also contraindicated in pregnant patients. It has demonstrated teratogenic and embryotoxic effects in animal studies. In a systematic review, researchers found itraconazole to cause eye defects in babies whose mothers had exposure to the drug during pregnancy.

Itraconazole also has the potential for many drug-drug interactions because it is metabolized by cytochrome P450 3A4 in the liver, like many other drugs. For example, patients taking itraconazole and terfenadine, astemizole, or cisapride may have serious cardiac rhythm disturbances. Itraconazole can also prolong the sedative effects of medications such as midazolam and triazolam, which means clinicians should avoid

this combination. Itraconazole can also enhance the effects of oral antidiabetic drugs, which can result in severe hypoglycemia

Contraindication

Chronic or active liver disease

History of an allergic reaction to oral terbinafine

As terbinafine inhibits the hepatic CYP2D6 enzyme, drug interactions can occur. The list of potentially interacting drugs includes, but is not limited to, cimetidine, fluconazole, cyclosporine, rifampin, caffeine, paroxetine, codeine, metoprolol, simvastatin, nifedipine, digoxin, phenytoin, and many others.

Itraconazole

Itraconazole has a molecular formula of C35H38Cl2N8O4 and a molecular weight of 705.64. It is a white to slightly yellowish powder. It is insoluble in water, very slightly soluble in alcohols and freely soluble in dichloromethane. It has a pKa of 3.70 (based on extrapolation of values obtained from methanolic solutions) and a log (n-octanol/water) partition coefficient of 5.66 at pH 8.1.

Pharmacology

lipophilic itraconazole with hydroxypropyl-β-cyclodextrin, a ring of substituted glucose molecules, which improves the solubility of itraconazole. The enhanced absorption and bioavailability of itraconazole from these new formulations make them ideal for the treatment of systemic fungal infections in a wide range of patient populations.

Dosage formulation

Itraconazole is a available as 100 mg and 200 mg capsule for treatment of dermatophytosis

Mechanism of Action:

Itraconazole interacts with 14-α demethylase, a cytochrome P-450 enzyme necessary to convert lanosterol to ergosterol. As ergosterol is an essential component of the fungal cell membrane, inhibition of its synthesis results in increased cellular permeability causing leakage of cellular contents. Itraconazole may also inhibit endogenous respiration, interact with membrane phospholipids, inhibit the transformation of yeasts to mycelial forms, inhibit purine uptake, and impair triglyceride and/or phospholipid biosynthesis[11].

Indication

Itraconazole is used for the treatment of oropharyngeal candidiasis, vulvovaginal candidiasis, pityriasis versicolor, tinea pedis, tinea cruris, tinea corporis, tinea manuum, onychomycosis, histoplasmosis. It is indicated in the treatment of systemic candidiasis, aspergillosis, and cryptococcosis (including cryptococcal meningitis). It is also used for maintenance therapy in AIDS patients to prevent relapse of underlying fungal infections and in the prevention of fungal infection during prolonged neutropenia

Adverse Effect

Itraconazole is well tolerated by most patients, the most common side effects relating to gastrointestinal disturbances. The incidence of side effects increases with duration of treatment; administration for $\geqslant$ 1 month results in an incidence of adverse effects of 17.7%, with a resulting dropout rate of 4.7%. Itraconazole appears to be devoid of effects on the pituitary-testicular-adrenal axis at the dosages used to date. Rarely, transient increases in liver enzymes have occurred; however, no cases of symptomatic liver dysfunction have been reported. Seven instances of hypokalaemia have been described.[13]

Contraindications

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1.3 Rationale of the research:

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1.4 Hypothesis:

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Combined oral Terbinafine & Itraconazole is more efficacious than single oral Terbinafine in the treatment of dermatophytes.

1.5 Objectives:

a. General objective

- To evaluate the efficacy of oral Terbinafine vs Terbinafine & Itraconazole combination in the treatment of Dermatophytosis.

b. Specific objective

- To see the effectiveness of combination drug.

1.6 Literature Review:

Relevant previous works:

In a hot and humid country like India, the prevalence of superficial mycotic infections is on the rise due to contributing environmental and demographic factors. In this study, we sought to assess the efficacies of two oral antifungal drugs, Itraconazole (a traditional azole) and Terbinafine (the only orally available allylamine). The two drugs were analyzed to see whether they differed significantly in their cure rates of tinea cruris. Since data, that compares only systemically administered Itraconazole and Terbinafine in the treatment of tinea cruris, is limited, this study becomes imperative.

Superficial mycosis is estimated to be one of the most prevalence infections, affecting roughly quarter of the world's population. Among the various classes of cutaneous mycoses, dermatophytes are the most common causative agents. Generally referred to as ringworm or tinea, this specific group of dermatophytes include the genera Microsporum, Trichophyton and Epidermophyton. Transmission of this disease occurs either by direct contact with infected humans or animal or indirectly by contact with contaminated fomites. Incidence of dermatophytosis in India ranges from 36.6% to 78.4% due to the high temperature and humidity that contributes to excess sweating, maceration, and alkaline pH; these environmental factors are ideal for the keratinophilic fungi. Hence, certain parts of the body, namely intertriginous areas (web spaces and groins) are more susceptible to the infections since they provide favorable media for the fungi to grow. Despite being a superficial and largely painless, tinea can also invade

deeper into the tissues and cause a disseminated infection, depending on the host's immune status and hence the disease should not be neglected. The presentations and severity of tinea is dependent largely on the host's immune status. Diseases such as diabetes mellitus, lymphomas, Cushing's syndrome as well as old age compromise a person's immunity and can result in severe and widespread dermatophytosis. True to its more common name, ringworm, this cutaneous fungal infection has a classical appearance of a central clearing that is surrounded by an active border of redness and scaling. When present in the inguinal region, this disease presents as bilateral, dull red, pruritic plaques that have prominent scaly edges and minute papules or pustules at their margins. Traditionally, azole antifungals such as Itraconazole, when present in therapeutic concentrations, interrupt the functions of ergosterol that is present in the fungal membranes and disrupt both the structure of the membrane as well as its functions (nutrient transport and chitin synthesis). Sertaconazole, on the other hand, is a relatively new benzothiophene imidazole derivative that indirectly inhibits ergosterol synthesis and directly inhibits the non-sterol component of the fungal cell membrane as well. Its collective action results in leakage of intracellular components and results in rapid cell death. In addition, the lipophilic property of the benzothiophene ring enables prolonged dermal retention that permits just once-daily application of 2% sertaconazole cream. Terbinafine is the only orally administered allylamine that is available commercially. It inhibits ergosterol synthesis at the stage of squalene epoxidation and is highly effective for majority of the dermatophytes. Terbinafine demonstrates a good safety profile while achieving high concentrations in keratinous tissues that are maintained for up to months.

The antifungal agents utilized for this study were Terbinafine and Itraconazole, both of which were systemically administered, along with topical 2% Sertaconazole cream. We sought to assess whether two oral antifungal drugs, Itraconazole and Terbinafine differed significantly in their cure rates of tinea cruris in this study. The objective of this study was to compare the therapeutic efficacy of Terbinafine and Itraconazole in the treatment of tinea cruris[12].

Chapter: Two

Materials and Methods

2. Materials and Methods

2.1 Type of study

This will be a Quasi – experimental study.

2.2 Place of study:

Department of Dermatology and Venereology at ZH Sikder Women's Medical College Hospital, Dhaka.

2.2 Period of the study:

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from 01 July 2020 to 15 December 2021

2.3 Study population:

Patients suffering from Dermatophytosis in the outpatient department of Dermatology & Venereology at ZH Sikder Women's Medical College & Hospital, Dhaka will be undertaken as study population.

2.4 Sample size and the statistical basis:

Out of 120 patients 28 patients missed during the treatment period. Therefore only 92 patients will be taken, out of which 46 patients will be treated with single Terbinafine 250 mg. and 46 patients will be treated with oral Terbinafine 250 mg & Itraconazole 200 mg combined. Following formula & purposive sampling will be carried out;

Sample size:

Sample size is selected using the following statistical formula:

$$n = \frac{z^2 pq}{d^2}$$

Z= Standard normal deviation = 1.96

P= Unknown Prevalence is .5= 50%

q = (1-p) = 0.50

d= Degree of allowable error

These assuming a 50% prevalence of Dermatophytosis and degree of allowable error 5%, we get the required sample size:

n= $(1.96)^2$ x .5 x .5 / $(0.05)^2$= 384

Due to lack of time, resources, accessibility and availability a total of 92 patients will be taken for the study.

2.5 Screening method:

Patients will be selected by taking complete history and diagnosed clinically by the presence of erythematous papules, excoriation and burrows in the typical distributions (finger webs, wrists; axillae, areola, umbilicus, genitals) and also by microscopy of mite.

Patients will be selected by taking complete history and diagnosed clinically by the presence of erythematous plaque, excoriation or eczematization and lesion in the typical distributions (axillae, groin, genitals, trunk, hand, feet, scalp, face) and also by microscopy of mite. It was a Judgmental sampling conducted in the dermatology outpatient. Clinically confirmed cases of Dermatophytosis were recruited for the study and followed up 2 times for a month, till the completion of their treatment. After informed written consent, the patient's history (age, sex, family history, precipitating factors (diabetes, hypertension, poor hygiene), past history of infection and treatments, duration of current infection and associated disorders) was obtained and he/she was evaluated on the basis of three parameters: Cutaneous Lesions, Pigmentation and Pruritis. Each parameter was graded on a 4-point scale (0=absent, 1=mild, 2=moderate and 3=severe). Each parameter was graded with a 10cm long visual analog scale (Figure 1) under direct supervision of the dermatologist (Score 0 on the visual analog scale=absent, scores 1-3=mild, 4-7=moderate and 8-10=severe)

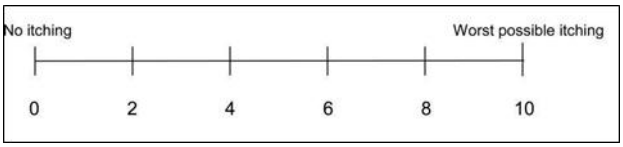


Figure 1: Visual analog scale.

Patients were then randomly divided into groups A and B and allotted the respective drugs (Table 1). They were followed-up every two week for a month and during each visit, the scores were calculated as mentioned above and recorded for statistical analysis. History was also obtained regarding diabetes milletus, hypertension and other co morbidities such as cardiac/ renal/ hepatic diseases, and medication history for these conditions if any was also noted.Any reported adverse drug reactions were also noted.There were four scheduled visits during the study; baseline visit, after 2ndweek, 4th week, 6th and8th week (follow up for KOH scraping). All cases of dermatophytoses of the skin, diagnosed clinically were recorded along with age, sex, and duration of disease. Chronic and non-chronic cases were decided according to disease duration.

2.6 Sampling method:

Purposive sampling or Judgmental sampling

2.7 Inclusion and exclusion criteria:

2.7.1Inclusion criteria

Newly diagnosed patients of scabies, of either gender, above 12 years of age, willing to participate, and give written informed consent.

For inclusion, the patients had to satisfy the presence of at least three of the following clinical criteria.

(a) Demonstration of burrow

(b) Presence of pruritic lesions at the classical sites

(c) Nocturnal pruritus

(d) Family history of similar illness

(e) Microscopic examination of mite

2.7.2 Exclusion criteria:

(a)

(b)

(c)

(e)

(d)

(d)

2.8 Operational definitions:

Tinea pedis

Athlete's foot (tinea pedis) is a fungal skin infection that usually begins between the toes. It commonly occurs in people whose feet have become very sweaty while confined within tight-fitting shoes. Signs and symptoms of athlete's foot include an itchy, scaly rash.Burrow. Burrow is the pathognomic lesion of scabies, which is a thin, thread like, linear lesion, that is 1 to10mm in length and is a tunnel caused by the movement of the mite in the st.corneum, usually in areas with few or no hair follicles, usually where stratum corneum is thin and soft, i.e. interdigital webs of hands, wrists, shaft of penis, elbows, feet, buttocks, and axillae.

Tinea unguium

Tinea unguium also known as Onychomycosis is a fungal infection of the nail. Symptoms may include white or yellow nail discoloration, thickening of the nail, and separation of the nail from the nail bed. Toenails or fingernails may be affected, but

it is more common for toenails. Complications may include cellulitis of the lower leg. A number of different types of fungus can cause onychomycosis, including dermatophytes and Fusarium.

Tinea cruris

Tinea cruris, also known as jock itch, is a common type of contagious, superficial fungal infection of the groin region, which occurs predominantly but not exclusively in men and in hot-humid climates. Typically, over the upper inner thighs, there is an intensely itchy red raised rash with a scaly well-defined curved border. It is often associated with athletes foot and fungal nail infections, excessive sweating and sharing of infected towels or sports clothing. It is uncommon in children.

Tinea manuum

is a fungal infection of the hand, mostly a type of dermatophytosis, often part of two feet-one hand syndrome. There is diffuse scaling on the palms or back of usually one hand and the palmer creases appear more prominent. When both hands are affected, the rash looks different on each hand, with palmer creases appearing whitish if the infection has been present for a long time. It can be itchy and look slightly raised.

Tinea capitis

Tinea capitis (also known as "herpes tonsurans", "ringworm of the hair", "ringworm of the scalp", "scalp ringworm", and "tinea tonsurans" is a cutaneous fungal infection (dermatophytosis) of the scalp. The disease is primarily caused by dermatophytes in the genera Trichophyton and Microsporum that invade the hair shaft. The clinical presentation is typically single or multiple patches of hair loss, sometimes with a 'black dot' pattern (often with broken-off hairs), that may be accompanied by inflammation, scaling, pustules, and itching. Uncommon in adults, tinea capitis is predominantly seen in pre-pubertal children, more often boys than girls.

Tinea faciei

Tinea faciei is a fungal infection of the skin of the face. It generally appears as a photosensitive painless red rash with small bumps and a raised edge appearing to

grow outwards, usually over eyebrows or one side of the face. It may feel wet or have some crusting, and overlying hairs may fall out easily. There may be a mild itch.

Tinea barbae

is a fungal infection of the hair. Tinea barbae is due to a dermatophytic infection around the bearded area of men. Generally, the infection occurs as a follicular inflammation, or as a cutaneous granulomatous lesion, i.e. a chronic inflammatory reaction. It is one of the causes of folliculitis. It is most common among agricultural workers, as the transmission is more common from animal-to-human than human-to-human. The most common causes are *Trichophyton mentagrophytes* and *T. verrucosum*.

Terbinafine:

Terbinafine is an antifungal medication used to treat pityriasis versicolor, fungal nail infections, and ringworm including jock itch and athlete's foot. It is either taken by mouth or applied to the skin as a cream or ointment. The cream and ointment are effective for nail infections.

Itraconazole:

Itraconazole is an antifungal medication used to treat a number of fungal infections. This includes aspergillosis, blastomycosis, coccidioidomycosis, histoplasmosis, and paracoccidioidomycosis. It may be given by mouth or intravenously.

2.9 Outcome variables

a. Main outcome variables

-
-
-
-
-

b. Confounding variable:

2.10 Procedures of preparing and organizing material:

Patients of clinically diagnosed case of scabies attending in OPD of Dermatology & Venereology in ZH Sikder Women's Medical College Hospital, Dhaka fulfilling inclusion criteria will be included in the study after taking informed written consent.

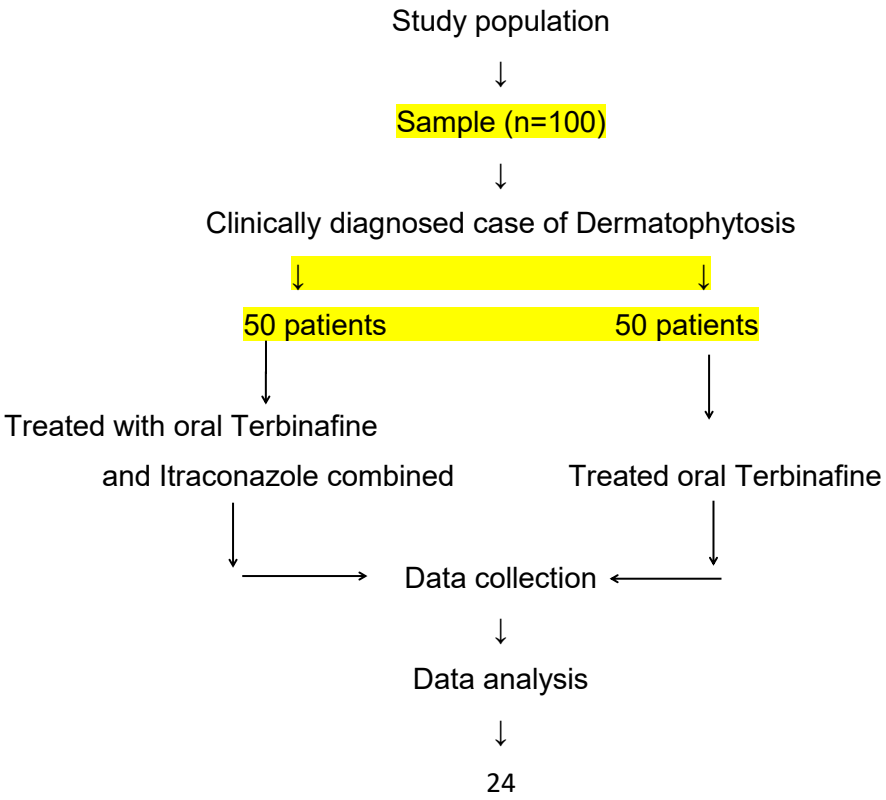
2.11Equipment to be used:

- Predesigned case record from
- Informed written consent form

2.12 Procedures of collecting data:

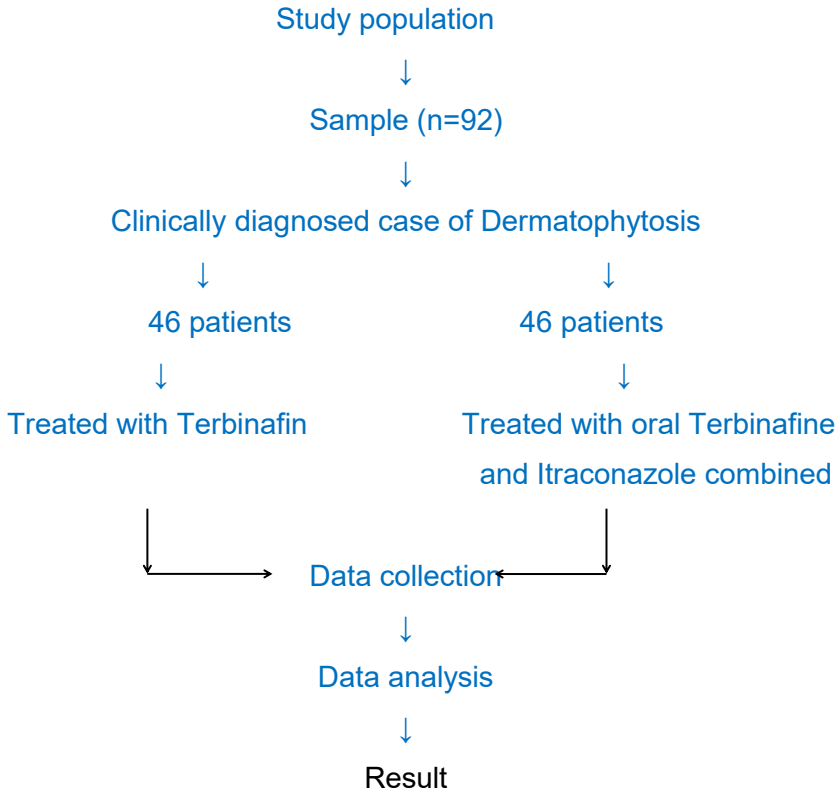
All patients diagnosed of dermatophytosis on history and examination will be recruited as per inclusion criteria. They will be divided by using random number table into group A and group B. Will be given Terbinafine 250 mg in Group A. And oral Terbinafine 250 mg & oral Itraconazole 200 mg will be given to Group B. The medicine will be purchase by the patients himself or herself

2.13Flow chart showing the sequence of tasks



Or

Result



2.14 Time table

Activity	August'16	September to December 2016				January'17
Problem definition						
Approach to patients						
Research Design						
Dta collection						

Data analysis						
Report writing						
Submission						

Activity	August 2020	September 2020 to November 2021				December 2021
Problem definition						
Approach topatients						
Research Design						
Data collection						
Data analysis						
Report writing						
Submission						

2.15 Professional assistance from experts:

Analysis was done with the help of professional statistician.

2.16 Procedure of data analysis:

Data were entered into Microsoft excel datasheet and was analyzed using SPSS 20 version software. The data attained was analysed on the basis of drug distribution as per age, sex, predisposing factors (diabetes, hypertension, poor hygiene) and recurrence. Statistical Analysis Data were collected and continuous variables were expressed as mean ± standard deviation (parametric data). Categorical data was represented in the form of frequencies and proportions. Chi square test was used as a test of significance to identify the mean difference between two qualitative variables. The changes in symptom score from baseline for each drug as well as the difference in the scores between the two drugs at the end of the 8th week were analyzed. Wilcoxon Signed-Ranks Test was used to compare the paired data of same group and Mann-

Whitney Test was used to compare the data of both groups. Level of significance was set at 0.05 and $P < 0.05$ was considered as statistically significant.

2.17 Quality assurance strategy:

It is extremely important that data collection will be of good quality. Regular instruction from supervisor will be taken. Patients will be examined carefully; regular follow up will be strictly maintained.

2.18 Ethical implication

The researcher will be duly careful about ethical issues related to this study. In this study the following criteria will be set to ensure maintaining the ethical values.

1. All patients were given an explanation of the study including the risks and benefits.
2. All patients were included in the trial after taking their informed consent.
3. The researcher was also explain them that they have the right to refuse or accepts to participate in the study.
4. The patient was not gained financially from the study.
5. All data obtained during the study period from the patient remain confidential.
6. Permission was granted by the ethical committee and informed consent was taken from all patients.

Chapter: Three

Results and Observation

Results and Observation:

This clinical trial was conducted in the Department of Dermatology and Venereology, Zainul Haque Sikder Women's Medical College & Hospital at Rayerbazar, Dhaka between the periods of July 2020 to Dec 2021 for duration of 18 months. The study was conducted to find out the comparison of efficacy Terbinafin & itraconazole vs Terbinafin in the treatment of Dermatophytosis. Pregnant and lactating women, patients with immunodeficiency or severe systemic disease or with heavily crusted or nodularlesions or secondary infection or eczematization and coexisting dermatological disease and with known hypersensitivity to the trial drugs were also excluded from the study.In present study, total of 92 patients of dermatophytosis of age group 16-67 years were analyzed. They were randomized into two groups. Group-A Terbinafin (n=46) and Group-B Terbinafin and itraconazole (n=46). All patients completed 2 weeks study period were reviewed after 14th day, 28th day, 42th day and 56th day. A detailed analysis revealed that the disease was common in males and females both, the male to female ratio being 0.95:1, i.e., 48.9% were males and 51.1% were females (Group-A: 0.76:1, Group-B: 1.19:1). The mean age of the sample was 38.67±13.16 years (Group-A: 38.85±13.95 years and Group-B: 38.50±12.47 years). Marital Status was single 20 (21.7%) and married 72 (78.3%). The maximum number of patients educational level were Graduate & Above 38 (41.3%) and HSC level 26 (28.3%). The no. of patients occupation of Housewife was 33 (35.9%) and Service was 28 (30.4%). According to age In Group-A majority of the patients were in the age group of 23-32 years which as 13 (28.3%) cases followed by 13-22 years were 05 (10.9%) cases, 33-42 years were 12 (26.1%) cases, 43-52 years were 08 (17.4%) cases and >52 years were 08 (17.4%) cases respectively. In Group-B majority of the patients were in the age group 33-42 years 15 (32.6%) followed by 13-22 years 04 (8.7%), 23-32 years 12 (26.1%), 43-52 years 07 (15.2%) and >52 years 08 (17.4%) cases respectively. Type of pruritus were severe 68 (73.9%) and moderate 24 (26.1%). Patients said to not be sufferings from any other diseases were 89 (96.7%) and 14 (15.2%) patients used fluconazole in past. The maximum number of patients said that they had no Anemia & Jaundice diseases. The maximum number of patients said that they had no diseases in Hair & Nail. Patients selected by taking complete history and diagnosed clinically by the presence of erythematous plaque present 92 (100%), excoriation or eczematization present 71 (77.2%), absent 21 (22.8%) and no. of the lesion multiple 86 (93.5%) & few 6 (6.5%). Axillae (24.65%), Groin (23.82%), Genitals (18.28%) & Hand (14.68%) were the most

common site of involvement. No patients claimed to be suffering from respiratory system, CVS and Alimentary system. Microscopic examitation conducted only skin. Microscopy on hyphae present only baseline and later follow up weeks hyphae was absent.

Table-1: Distribution of patients according to sex:

Sex	Group-A(n=46)	Group-B (n=46)	p value
Male	20 (43.5%)	25 (54.3%)	0.404
Female	26 (56.5%)	21 (45.7%)	
Total	**46 (100.0)**	**46 (100.0)**	

Chi-square test was done to measure the level of significance, ns= not significant
Figure within parentheses indicated in percentage

Table-1 shows the distribution of patients according to sex. In Group-A female was predominant than male which was 26 (56.5%) cases and 20 (43.5%) cases respectively. In Group-B male was predominant than female which was 25 (54.3%) cases and 21 (45.7%) cases respectively. The difference between these two group was not statistically significant. (p value >0.05)

Table-2: Distribution of patients according to age group

Age (in years)	Group-A (n=46)	Group-B (n=46)	p value
13 – 22	05 (10.9%)	04 (8.7%)	
23 – 32	13 (28.3%)	12 (26.1%)	
33 – 42	12 (26.1%)	15 (32.6%)	0.968
43 – 52	08 (17.4%)	07(15.2%)	
>52	08 (17.4%)	08 (17.4%)	
Total	**46 (100.0%)**	**46 (100.0%)**	
Mean ± SD	38.85 ± 13.95	38.50 ± 12.47	

Chi-square test was done to measure the level of significance, ns= not significant
Figure within parentheses indicated in percentage

Table-2 shows the distribution of patients according to age Group-A majority of the patients were in the age group of 23-32 years which as 13 (28.3%) cases followed by 13-22 years were 05 (10.9%) cases, 33-42 years were 12 (26.1%) cases, 43-52 years were 08 (17.4%) cases and >52 years were 08 (17.4%) cases respectively. In Group-B majority of the patients are in the age group 33-42 years 15(32.6%) followed by 13-22 years 04 (8.7%), 23-32 years 12 (26.1%),43-52years 07 (15.2%) and >52 years 08 (17.4%) cases respectively. The difference between the ages of the two groups was not significant. (p value >0.05)

Table-3: Patients according to site of involvement.

Site of involvement	Group-A (n=46)	Group-B (n=46)
Axillae	44 (95.7%)	45 (97.8%)
Groin	44 (95.7%)	42 (91.3%)
Genitals	41 (89.1%)	25 (54.3%)
Trunk	13 (28.3%)	19 (41.3%)
Hand	27 (58.7%)	26 (56.5%)
Feet	11 (23.9%)	12 (26.5%)
Scalp	04 (8.7%)	08 (17.4%)
Face	01 (2.2%)	0 (0%)

Table-3 shows the distribution of patients according to site of involvement. In Group-A shows that the most common site was the Axillae and Groin 44 (95.7%) both followed by Genitals 41(89.1%), Trunk13 (28.3%),Hand 27 (58.7%), Feet 11 (23.9%), Scalp 04 (8.7%) and Face01 (2.2%). In Group-B shows that the most common site was Axillae 45 (97.8%) followed by Groin 42 (91.3%), Genitals 25 (54.3%), Trunk 19 (41.3%), Hand 26 (56.5%), Feet 12 (26.5%) and Scalp 08 (17.4%).

Table-4: Patients according to Pruritus History.

Pruritus	Group-A (n=46)	Group-B (n=46)	p value
Mild	0 (0%)	0 (0%)	
Moderate	18 (39.1%)	6 (13%)	0.008
Severe	28 (60.9%)	40 (87%)	
Total	**46 (100.0)**	**46 (100.0)**	

Chi-square test was done to measure the level of significance, ns= not significant

Figure within parentheses indicated in percentage

In Group-A, 39.1% of patients had moderate pruritus. In Group-B, 13% of patients had moderate pruritus. The majority of patients in both groups were severe pruritus. The difference between the pruritus of the two groups was significant. (p value <0.05)

Table-5: Diabetic history comparison between two groups

Diabetes milletus	Group-A(n=46)	Group-B (n=46)	p value
Yes	3 (6.5%)	0 (0%)	0.242
No	43 (93.5%)	46 (100%)	
Total	**46 (100.0)**	**46 (100.0)**	

Chi-square test was done to measure the level of significance, ns= not significant

Figure within parentheses indicated in percentage

In Group-A, 6.5% of patients were diabetes milletus and in Group-B, 0% had a history of diabetes. The majority of patients in both groups were non diabetics. There was no significant difference in diabetes history between two groups. (p value>0.05)

Table-6: Patients according to Drug History.

Drug	Group-A(n=46)	Group-B (n=46)	p value
Yes	6 (13%)	8 (17.4%)	0.773
No	40 (87%)	38 (82.6%)	
Total	**46 (100.0)**	**46 (100.0)**	

Chi-square test was done to measure the level of significance, ns= not significant

Figure within parentheses indicated in percentage

Both groups used drug fluconazole. In Group A & B used no drug 87% & 82.6% respectively. There was no significant difference in Drug History between two groups. (p value>0.05)

Table-7: Patients according to Disease.

Disease	Group-A (n=46)	Group-B (n=46)
Anaemia (Yes)	0 (0%)	1 (2.2%)
Anaemia (No)	46 (100%)	45 (97.8%)
Jaundice (Yes)	0 (0%)	0 (0%)
Jaundice (No)	46 (100%)	46 (100%)

In Group-A 100% and in Group-B 97.8%of patients had no anaemia. On the otherside in Group-A 100% and in Group-B 100%of patients had no jaundice.

Table-8: Patients according to exam of integumentary system

Type	Group-A (n=46)	Group-B (n=46)
Hair (Involved)	0 (0%)	2 (4.3%)
Hair (Not Involved)	46 (100%)	44 (95.7%)
Nail (Involved)	0 (0%)	2 (4.3%)
Nail (Not Involved)	46 (100%)	44 (95.7%)
Plaque (Present)	46 (100%)	46 (100%)
Plaque (Absent)	0 (0%)	0 (0%)
Excoriation (Present)	46 (100%)	25 (54.3%)
Excoriation (Absent)	0 (0%)	21(45.7%)

The majority of patients in both groups were not involved in hair & nail. Both groups 100% of patients were plaque present. In Group-A, 100% of patients had excoriation present. In Group-B, 54.3% of patients had excoriation present and 45.7% of patients had excoriation absent.

Table-09: Frequency of the scores at baseline visit.

Scores	Cutaneous lesions		Pigmentation		Pruritus	
	Group-A	Group-B	Group-A	Group-B	Group-A	Group-B
0(absent)	0	0	0	2	0	0
1 (mild)	0	0	12	11	1	0
2 (moderate)	18	10	34	26	22	9
3 (severe)	28	36	0	7	23	37

Table-10: Frequency of the scores in the 8th week.

Scores	Cutaneous lesions		Pigmentation		Pruritus	
	Group-A	Group-B	Group-A	Group-B	Group-A	Group-B
0(absent)	24	41	2	7	37	39
1 (mild)	19	2	36	38	8	6
2 (moderate)	3	3	8	1	1	1
3 (severe)	0	0	0	0	0	0

During baseline visits, majority of patients in Group-A suffered from severe Cutaneous lesions and Pruritus but moderate Pigmentation was more frequently seen. Similar findings were evident for Group-B as well. Group-B saw highest frequency of severe scores in two parameters. During the 8th visit, Group-B showed higher improvement rates as compared to Group-A. Group-B had higher frequency of score 0 in all three parameters.

Table-11: Clinical scores of Cutaneous lesions in Group-A & Group-B

	Group-A (n=46)					Group-B (n=46)				
	Baseline	Week-02	Week-04	Week-06	Week-08	Baseline	Week-02	Week-04	Week-06	Week-08
Mean±SD	7.48±1.3	4.76±1.5	2.63±1.9	1.74±1.9	1.20±1.5	8.00±0.8	4.5±2.2	2.24±2.0	0.54±1.1	0.52±1.5
Z-Value	-	-6.252	-6.014	-5.973	-6.193	-	-5.635	-5.790	-6.082	-6.151
P-Value	-	.000<.05	.000<.05	.000<.05	.000<.05	-	.000<.05	.000<.05	.000<.05	.000<.05

Wilcoxon Signed Ranks Test test was done to measure the level of significance, ns= not significant , p<0.05

Table-12: Clinical scores of Pigmentation in Group-A & Group-B

	Group-A (n=46)					Group-B (n=46)				
	Baseline	Week-02	Week-04	Week-06	Week-08	Baseline	Week-02	Week-04	Week-06	Week-08
Mean±SD	3.87±1.1	3.37±1.1	2.89±1.3	2.57±2.5	2.37±1.1	5.65±2.4	4.52±1.7	3.35±1.6	2.26±1.2	1.26±0.93
Z-Value	-	-2.556	-4.359	-4.579	-5.112	-	-0.147	-3.258	-4.900	-5.445
P-Value	-	.000<.05	.000<.05	.000<.05	.000<.05	-	.883>.05	.000<.05	.000<.05	.000<.05

Wilcoxon Signed Ranks Test test was done to measure the level of significance, ns= not significant , p<0.05

Table-13: Clinical scores of Pruritus in Group-A & Group-B

	Group-A (n=46)					Group-B (n=46)				
	Baseline	Week-02	Week-04	Week-06	Week-08	Baseline	Week-02	Week-04	Week-06	Week-08
Mean±SD	6.72±1.8	3.13±1.8	1.35±1.5	1.17±1.6	0.46±1.1	7.98±1.1	3.04±1.9	1.28±1.3	0.41±1.1	0.37±1.1
Z-Value	-	-6.078	-5.881	-6.144	-6.035	-	-5.937	-6.095	-6.155	-6.173
P-Value	-	.000<.05	.000<.05	.000<.05	.000<.05	-	.000<.05	.000<.05	.000<.05	.000<.05

Wilcoxon Signed Ranks Test test was done to measure the level of significance, ns= not significant , p<0.05

The changes in Cutaneous lesions, Pigmentation and Pruritis from the baseline visit for Group-A (Terbinafine) were statistically significant at 8th week with p value being less than 0.05 for all parameters and The changes in Cutaneous lesions, Pigmentation and Pruritis from the baseline visit for Group-B (Terbinafine & itraconazole) were statistically significant at 8thweek with p value being less than 0.05 for all parameters.

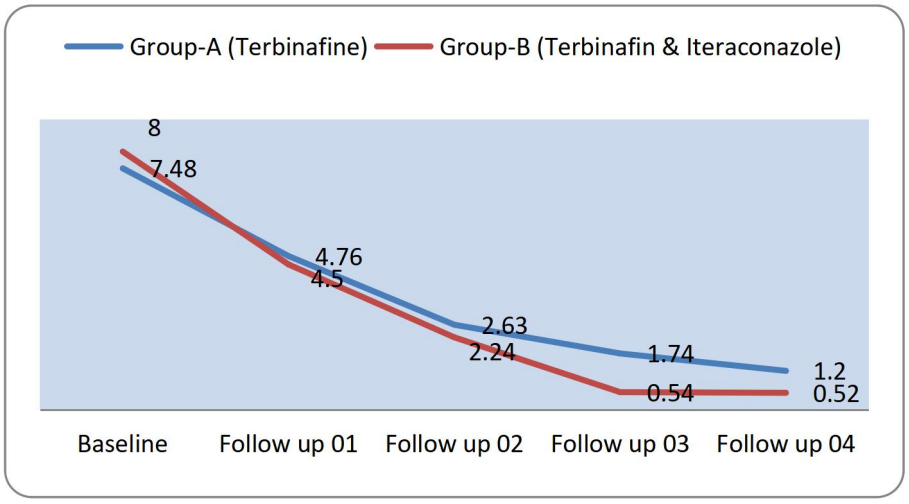


Figure 2: Comparison of Cutaneous lesions scores for the two medications.

The mean Cutaneous lesions scores of the two drugs were nearly equal for the first two visits but during the final visits (8th week), Cutaneous lesions score for Group-A (Terbinafine) was 1.2 while that of Group-B (Terbinafine & itraconazole) was 0.52. Overall, differences at 8thweekfrom the baseline scores for Group-A and B were 6.28 and 7.48 respectively (Figure 2).

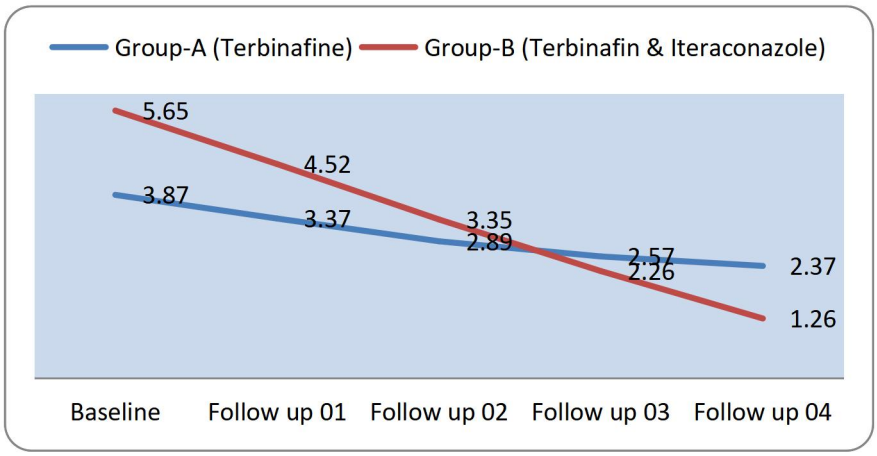


Figure 3: Comparison of Pigmentation scores for the two medications.

Initially, the mean Pigmentation score for Group-A (Terbinafin) was 3.87 and Group-B (Terbinafin & itraconazole) was 5.65. The score for Group-A decreased dramatically during the 4thweek (with a difference of 0.98) whereas Group-B showed a difference of 2.3 in that week. The scores decreased progressively for the two drugs for the next two weeks and finally at week 8, the scores for Group-A and B were 2.37 and 1.26 respectively. Group-B showed an overall difference of 4.39 while Group-A showed only a difference of 1.5 from the baseline visit (Figure 3).

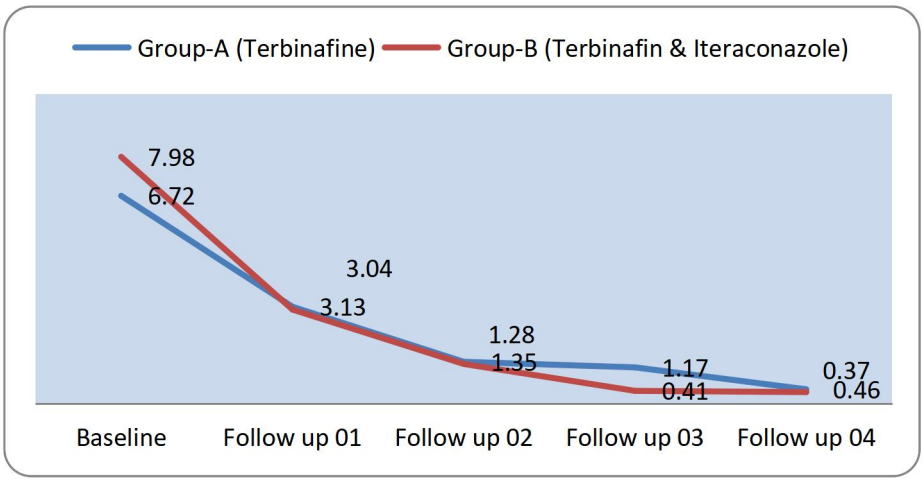


Figure 4: Comparison of Pruritus scores for the two medications.

The baseline scores for Pruritus scores were 6.72 for Group-A (Terbinafin) and 7.98 for Group-B (Terbinafin & itraconazole). At the end of the 8th week, the differences in the scores were 6.26 for Group-A and 7.61 for Group-B (Figure 4).

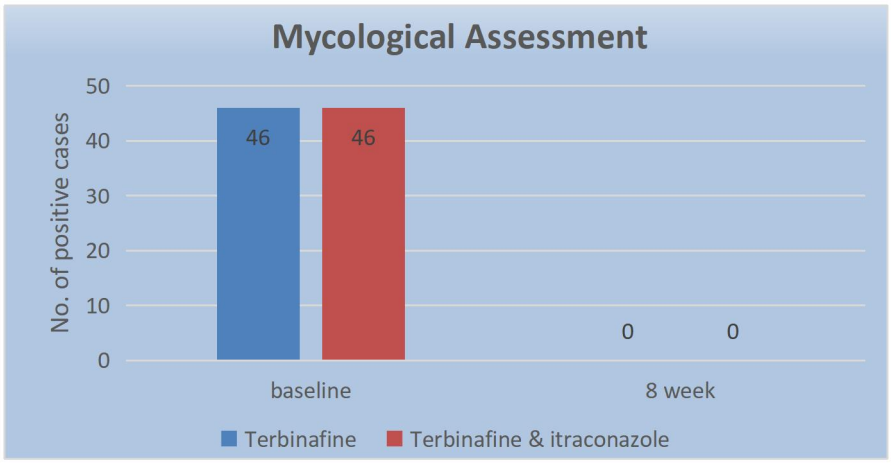


Figure 5: Comparison of Mycological cure in both the groups

Mycological assessment at baseline, all the patients were KOH positive (hyphae seen), and at the completion of therapy, both the groups showed 100% KOH negative (hyphae not seen), as depicted in Figure 5.

Table-14: Clinical Scores of Cutaneous lesions in Group-A Vs. Group-B

	Baseline	Baseline	Week-2	Week-2	Week-4	Week-4	Week-6	Week-6	Week-8	Week-8
	G-A	G-B	G-A	G-B	G-A	G-B	G-A	G-B	G-A	G-B
Mean±SD	7.48±1.3	8.00±0.8	4.76±1.5	4.5±2.2	2.63±1.9	2.24±2.0	1.74±1.9	0.54±1.1	1.20±1.5	0.52±1.5
Z-Value	-1.803		-0.834		-1.349		-2.967		-3.581	
P-Value	.071>0.05		.404>0.05		.177>0.05		,003<0.05		.000<0.05	

Mann-Whitney Test test was done to measure the level of significance, ns= not significant , p<0.05

The mean clinical cutaneous lesions score at baseline was 7.74±1.13 (Group-A: 7.48±1.30 and Group-B: 8.00±0.80) and 8th week was 0.86±1.57 (Group-A:1.20±1.5 and Group-B: 0.52±1.5). There was significant decrease in the clinical score beginning from baseline to 8th week in both the groups. If we compare the clinical score of both the groups after 8th week there is slight more reduction of clinical score in Group-B than of Group-A. There were statistically significant at 8thweek with p value being less than 0.05.

Table-15: Clinical Scores of Pigmentation in Group-A Vs. Group-B

	Baseline	Baseline	Week-2	Week-2	Week-4	Week-4	Week-6	Week-6	Week-8	Week-8
	G-A	G-B	G-A	G-B	G-A	G-B	G-A	G-B	G-A	G-B
Mean±SD	3.87±1.1	5.65±2.4	3.37±1.1	4.52±1.7	2.89±1.3	3.35±1.6	2.57±2.5	2.26±1.2	2.37±1.1	1.26±0.9
Z-Value	-.780		-3.305		-1.417		-1.527		-2.813	
P-Value	.435>0.05		.001<0.05		.157>0.05		.127>0.05		.005<0.05	

Mann-Whitney Test test was done to measure the level of significance, ns= not significant , p<0.05

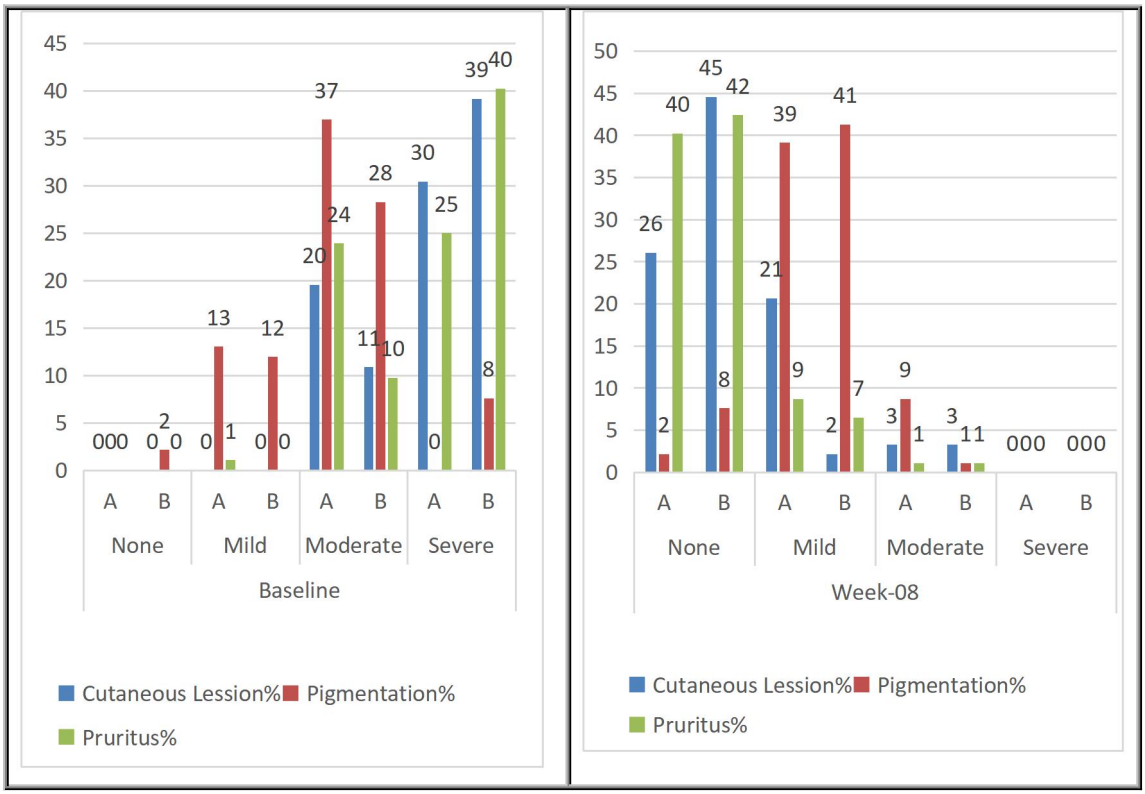
The mean clinical pigmentation score at baseline was 4.76 ± 2.09 (Group-A: 3.87 ± 1.12 and Group-B: 5.65 ± 2.40) and 8th week was 1.82±1.15 (Group-A: 2.37±1.1 and Group-B: 1.26±0.9). There was significant decrease in the clinical score beginning from baseline to 8th week in both the groups. If we compare the clinical score of both the groups after 8th week there is slight more reduction of clinical score in Group-B than of Group-A. There were statistically significant at 8th week with p value being less than 0.05.

Table-16: Clinical Scores of Pruritus in Group-A Vs. Group-B

	Baseline	Baseline	Week-2	Week-2	Week-4	Week-4	Week-6	Week-6	Week-8	Week-8
	G-A	G-B	G-A	G-B	G-A	G-B	G-A	G-B	G-A	G-B
Mean±SD	6.72±1.8	7.98±1.1	3.13±1.8	3.04±1.9	1.35±1.5	1.28±1.3	1.17±1.6	0.41±1.1	0.46±1.1	0.37±1.1
Z-Value	-3.082		-0.185		-0.022		-2.943		-0.534	
P-Value	.002<0.05		.853>0.05		.983>0.05		,003<0.05		.593>0.05	

Mann-Whitney Test test was done to measure the level of significance, ns= not significant , p<0.05

The mean clinical pruritus score at baseline was 7.35 ± 1.63 (Group-A: 6.72 ± 1.82 and Group-B: 7.98 ± 1.13)and 8th week was 0.39±1.05 (Group-A: 0.46±1.1 and Group-B: 0.37±1.1). There was significant decrease in the clinical score beginning from baseline to 8th week in both the groups. If we compare the clinical score of both the groups after 8th week there is slight more reduction of clinical score in Group-B than of Group-A and statistically insignificant at 8th week with p value being greater than 0.05.



In Cutaneous Lesion clinical response rate of Group-B at 8th week was 45%, whereas, of Group-A was 26% patients were none Cutaneous Lesion. There is slight more increase in clinical response rate in Group-B than of Group-A. In Pigmentation clinical response rate of Group-B at 8th week was 41%, whereas, of Group-A was 39% patients were mild Pigmentation. There is slight more increase in clinical response rate in Group-B than of Group-A and In Pruritus clinical response rate of Group-B at 8th week was 42%, whereas, of Group-A was 40% patients were none Pruritus. There is slight more increase in clinical response rate in Group-B than of Group-A. Finally there was a significant decrease in the clinical score beginning from baseline to 8th week in both the groups. If we compare the clinical score of both the groups after 8th week, there is slight more reduction of clinical score in Group-B than of Group-A.

Chapter: Four

Discussion

Discussion:

Dermatophytosis, are the most common fungal infection worldwide. Transmission is mostly by direct contact with infected animals, humans or contact with fomites. Clinical features vary according to the etiological agent. Dermatophytes belong to the genera Microsporum, Trichophyton, Epidermophyton

Ninety-two patients diagnosed of scabies on history and examination was recruited as per inclusion criteria. They were divided by using random number table into group A and group B. Oral Terbinafine was given to group A in oral Terbinafine 250 mg two tablets daily. Group B were given oral combination Terbinafine 250 mg & Oral Itraconazole 200 mg for 6 weeks. Patients were followed up on day 7, 14 and assessed for the efficacy and safety.

According to age majority of the patients were in both groups were from 13-22 to 33-42 years in this study. The difference between the age group was not statistically significant (P = 0.156). In general, prevalence of scabies is more in children & young adult but it can affect all ages[3,16] .

In the study shows that the most common site was the wrist and genitalias48 (96.0%) followed by periumbilical region 47 (94.0%), finger web 45 (90.0%) lower on axillae35 (70.0%) and areola 23 (46.0%). In group B shows that the most common site wasgenitalias49 (98.0%) followed by finger web 47 (94.0%), wrist 46 (92.0%), periumbilical region 45 (90.0%), axillae33 (66.0%) and areola 24 (48.0%). The differences among the site of involvement of two groups were not significant. Almost similar results were found in a study that the most common site was the genitalia (98%) followed by wrist(96%) then periumbilical region(94%), and web space(94%) lower on axilla (70%) and areola (48%)[17].

Nocturnal pruritus was the most common clinical findings of integumentary system followed by erythematous papules, excoriations and burrows. There is no significant difference between the two groups in clinical features.

The cure rate was more in case of single application of topical Permethrin than single oral Ivermectin at 1st week, which was significant (p=<0.001). At 2nd week topical Permethrin has more cure rate than oral Ivermectin & it was also significant (p=<0.001). According to Aisha Mushtaq et al. topical Permethrin is used nowadays for being safer and more effective than the previously used other drugs[9].

The scoring of follow up and observation shows that the outcome of patients with topical Permethrin was better than the oral Ivermectin. Some previous study documented that single oral Ivermectin provide a cure rate of 70% whereas topical Permethrin was associated with 98.0% cure rate at 2nd week of treatment. Significantly According to Reena Sharma, Archana Singal; Both Permethrin and Ivermectin in both single and two dose regimen are equally efficacious and well tolerated in scabies[6].Usha and Nair have shown efficacy of Ivermectin 200µg/kg to be equivalent to topical 5% Permethrin[15].According to Munazza S, Lamees MM, M Jahangir there is no significant difference regarding efficacy of topical Permethrin and oral Ivermectin when used in treatment of scabies[7]. Ivermectin is known to have limited ovicidal activity. So that single oral dose is not appropriate for the treatment. On the other hand, Permethrin have ovicidal property,s o single application may be appropriate[15].

In the present study there was no clinically significant difference in nature, frequency, of severity of adverse events between the two treatment groups, as reported in earlier studies[15].

Chapter: Five

Conclusion and Recommendations

Conclusion

In conclusion, our study demonstrated that administration of single application of topical Permethrin was an effective and safe treatment for the treatment of scabies. Treatment with Permethrin has the benefits of rapid resolution of skin lesions and itching compared to oral Ivermectin.

Recommendations:

A Quasi – experimental study was conducted in Department of Dermatology at ZH Sikder Women's Medical College Hospital, Dhaka for 6 months duration. The objective of the study was to Comparison of Efficacy of Terbinafin and Itraconazole vs Terbinafin in the Treatment of Dermatophytosis.

Following recommendations are made based on the study findings:

- This study consists of small number of patients & shorter durations; it emphasizes the fact that further evaluation of the role of oral Ivermectin and topical Permethrin in the treatment of scabies in larger number of patients with longer duration will provide better clarification.
- More follow up should be done to evaluate the better outcome of the patients.
- Longitudinal studies (Cohort study) with larger samples can evaluate the effective and long term outcome for the patients.

Limitation of the study:

In our country, OTC drugs are available. Many patients had to be withdrawn from the study because they use OTC drugs in case of Ivermectin group for immediate relief.

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