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In Ramadi City, Several Agricultural And Phenotypic Techniques For Patients With Dermatophytes Are Being Investigated

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Abstract

This study was conducted to investigate the fungi that cause dermatophytes in humans, and 50 samples of people suspected of having dermatitis fungi were collected from Ramadi Teaching Hospital patients from the beginning of August to the end of November, and these models were taken from the skin, hair, and nails. Where samples were subjected to direct examination using a moisturizing swab with a 10% KOH solution at the same time that the samples were grown on the sabauroud dextrose agar medium to investigate the causative fungi for dermatophytes in humans, direct examination revealed positive results in 8 samples (16% of the total of 50 samples), while the laboratory cultured method revealed positive results in 22 samples (44%).

The results of the tests revealed the kind of infection, Tinea capitis, its rate, and gender connection. Females are infected at a rate of 46.7 % , while men are infected at a rate of 36.7 percent, with T. unguium inflicting 10 % of females and 6.7% of males.

Dermatophyte incidence varied depending on the region of residence where the majority of the infections were dermatophyte is caused by people living in rural areas due to a health condition deterioration caused by a lack of education and health knowledge, reduced health care, and the level of economic aid with dermatophyte occurrence.

Keyword: Dermatophyte, Tinea, culture method, KOH

1.Introduction:

The human skin is vulnerable to a number of injuries arising from exposure to various forms of environmentally created microorganisms. Dermatophytosis, often known as tinea or ringworm, is a highly contagious infectious skin condition that affects both people and animals. Dermatophytes are a kind of keratinophilic filamentous fungus that causes the illness. Based on conidia shape and accessory organs, dermatophytes are divided into three genera: Trichophyton, Microsporum, and Epidermophyton [1]

Fungi can be found on human barrier surfaces such as the mouth, skin, vaginal canal, stomach, and lungs. Increased vulnerability to fungal infections is caused by altered immunological state, which is generally induced by immunosuppressive medications but can also be caused by hereditary defects in host defense. Invasive fungal infections are linked to significant mortality rates, with an estimated 1.5 million people dying each year worldwide.

Invasive infections are less common than mucosal infections, which are a major source of morbidity. In contrast to bacterial and viral diseases, there is no effective vaccination against fungal infections[2]

Skin infections have been a common infection in humans for a long time, as millions of people worldwide are exposed to Tineas or Dermatophytosis, and they have significant advantages in having a keratinophilic or keratinolytic but it has the ability to penetrate deep tissue beneath the stratum corneum [3,4]

Despite the fact that the percentage of human pathogenic fungi and their importance are small in comparison to what bacteria and viruses cause, their importance is growing, particularly in cases of host exposure to immune deficiency caused by malignant tumors and ingestion of immunocompromising chemical drugs, as well as fungi's ability to produce fungal toxins that cause allergies and directly target tissues due to antibiotics'' difficulties [5,6]

Furthermore, because of the confusion and similarity in these fungi, the diagnosis of fungal skin diseases, particularly dermatophytes, is complex and difficult. Its symptoms are similar to and provided the scientific development of certain other skin diseases, such as eczema and psoriasis, for technology and the use of PCR technology, which provides prompt and guaranteed diagnostic methods[7].The fungi that infect the keratinized area of the skin in humans and animals (skin, nails, and hair) and affect the surface layer of the skin due to the fatty keratin tissue, where it secretes the keratinase enzyme that analyzes keratin, as well as other enzymes like protease, elastase, lipase, phospholipase, dinase, and alpha-amylase [8] . Aside from the enzymes stated above, protease enzyme plays a significant role in the virulence of these fungi and the degree of their pathogenicity due to their stratum corneum development sources of nitrogen and carbon are critical in its growth. Humans have known therapeutic fungus since they found the knowledge and development that led to fungal infection, also known as ring worm dermatology as the term of dermatophytes, going back to the sixteenth century AD, when skin and scalp lesions were identified since birth [9,10]

Mycoses are fungal infections caused by several types of illnesses. Fungal infections are grouped into categories based on the site of the damage and may be clinically classified into these fungi arise from the host and offer reports of Tinea Versicolor and Streptococcal infection, these injuries occur beneath the stratum corneum layer of the skin and may spread to living cells in people and animals, and an inflammatory reaction occurs as a result of the presence of these fungi, which may distinguish this type of injury. This infection is caused by dermatophytes [11]

Epidemiology of dermatophytes research performed in different regions of the world to investigate infections induced by the clinical forms of dermatophytes showed that there is a variation in infections and the types of dermatophytes that cause them significantly from one area to another in the same country and from one nation to another. Humidity, temperature, age, body posture, geographical location, and other skin illnesses that enhance the incidence of dermatophytes, such as keratin producing irregular disease, are among the most important factors that contribute to the spread of dermatophytes infection[12]. Tinea infection is the most common disease in various parts of the world, and the most common species has been identified, and the average person is not immune to infection with one of

the types of skin pillows during his lifetime, and a large percentage of healthy people have been found to be exposed to the infection. [13,14]The study objective examined the axes below:

Conducting a survey of cutaneous fungal infections in some areas of Ramadi by examining the rate of infection for certain forms of ringworms, Tinea and their prevalence in both sexes. Diagnosis of fungal isolates based on phenotypic and microscopic properties

2.Material and Methods

2.1Clinical sample collection:

From the beginning of August to the end of November, a clinical sample (50) of patients of all ages and sexes were gathered from Ramadi Teaching Hospital, and these models were obtained from the skin, hair, and nails). Small scales were removed from the border of bedsores using a sterile surgical blade and hair samples were collected using sterile forceps where the infection region was treated with ethyl alcohol at a 70% concentration[15]. Then transferred to the mycology laboratory / Department of Biology / College of Science / University of Anbar.

2.2 Direct microscopy samples

A small amount of skin, hair (using a pollen needle in a drop of potassium hydroxide, 10% concentration) was placed on a clean glass slide, and the skin sample is typically mashed using a 21 percent concentration of potassium hydroxide for nail samples using a sterile needle, and then the glass slide cover was placed over the sample. The prepared glass slide was softly heated by slowly turning on a light flame. The sample was kept at room temperature for 21 minutes before being brushed onto Slide with the needle base. Microscopically examine the sample for the presence of hyphae and other fungal structures on the powers 100 X and 40 X[16].

2.3 Culture samples:

The specimens were cultured on a medium of Sabauroud dextrose agar containing chloramphenicol 121 mg / ml to prevent bacterial growth, then cyclohoxamide at a concentration of 0.5mg /L was added to prevent the growth of contaminated fungi. Then pour the sterile sabauroud dextrose agar and stir the plates circular motion for 11 minutes before planting the dishes with the fungal vaccine, incubating the dishes at a temperature of 28 C for a period of 21 days [17].

2.4 Purification and preservation of fungi species:

The isolated fungi were purified by placing a small amount of the colony at a temperature of 30 ° C on the center of the Sabauroud dextrose agar, sterilized with plates, the isolates incubated for a period (14-21) days, then kept at 4 ° C [18].

2.5 Diagnosis of fungal species:

The phenotypic characteristics which include the shape, size, diameter, texture and color of the colony developed from the back of the plates analysis was carried out using taxonomic guide of fungi [19,20.]

2.6 Microscopic properties:

Include the presence, shape, and number of cells, of large and small conidia.It is achieved by moving a small part of the fungal colony to a drop of lacto phenol cotton blue dye on a clean glass slide using a sterile needle, as the slide was heated after inserting the slide cover by passing it slightly on the flame of a Bunsen lamp after which the slide was left for half an hour and then examined at 40 X under a microscope to observe the characteristics microscopy of the hypha and reproductive structures formed by fungi[21].

3. Statistical Analysis

Data were obtained, double entered, cleaned, and analyzed according to study objectives using SPSS version 20 software. Frequency and percentage were used to determine the impact.

4. Results and discussion

Dermatophytosis is a significant and common public health problem in many parts of Ramadi City Correct diagnosis is almost impossible based on the clinical symptoms alone. Clinical examination and use of microscopic and culture methods as traditional diagnostic instruments currently affirm the diagnosis of dermatophytosis in developing countries. The results showed the presence of dermatophytes in 30 samples from the total samples, While laboratory grown techniques yielded 20 negative instances, the sabauroud dextrose agar medium yielded 22 positive findings., while the number of direct microscopy (KOH) positive cases was 8 as shown in Table (1), Whereas the results of this table demonstrate that direct microscopy is more successful than culture medium transplant in the detection of skin damage, and these findings are consistent with the results obtained [22]. He stated that direct inspection is a detection or absence of fungus (Figure 1).The presence of negative tests, whether through methods of direct microscopy or by laboratory culture is the cause for many reasons, the most important of which is an erroneous clinical diagnosis where the injury is not fungal [23].The results of direct microscopic analysis compared to cultured analysis may be attributed to the fact that certain patients use treatments without consulting a physician, this can have an effect on the fungi's behavior It is possible that the damage was caused by a blunder in the process of storing samples prior to cultivation [24].

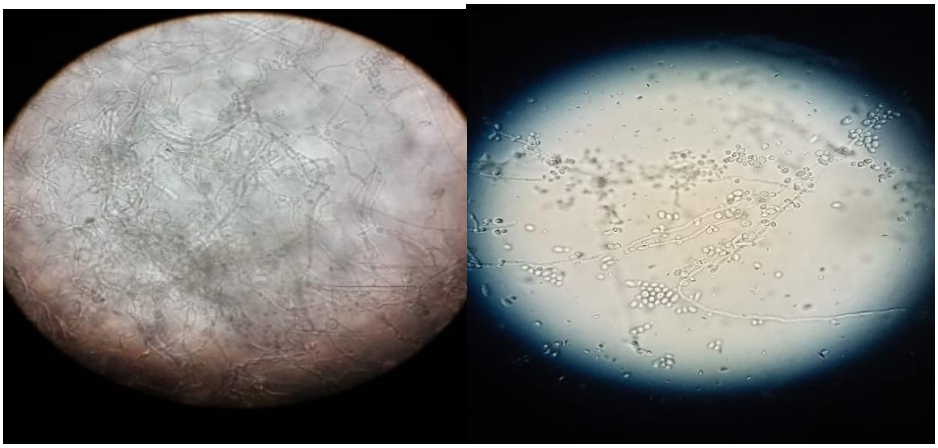

Figure 1: Microscopically examination of spores and hypha (40X)

Methods	Positive sample	percentage	Negative sample	percentage
Direct microscopy(KOH)	8	16%	42	84%
Culture	22	44%	28	56%

Table (1): Results of microscopy and culture method for samples

The results in Table (1) only show 30 samples that showed positive results from skin fungi infection via direct microscopic examination (KOH) and fungal implant using a sabauroud dextrose agar medium; in some cases, the appearance and microscopy is difficult or uncertain due to the large diversity or polymorphism of the type. Similarly, a future genotyping research will be beneficial for identifying fungus and improving diagnostic accuracy and speed [25]

Fungal infection	Female	percentage	male	percentage
T.capitis	14	46.7%	11	36.7%
T.unguium	3	10%	2	6.7%
Total	17		13	

Table (2): The relationship between the numbers of dermatophytes injuries and sex

The results shown in Table (2) the prevalence of tinea unguium and tinea capitis in the population studied was constituted the most infection in females by 46.7%, in males 36.7% and T. unguium the most common infection in females by 10% and in males by 6.7% where it was shown that females are more infected than males; females were more frequently affected than males, but there was no significant gender difference in the occurrence of foot mycoses. This might be attributed to aesthetic variables such as repeated painful pedicures and manicures, frequent housekeeping, and the use of detergents that damage nails[26]

Fungal infection	City		Rural	
	Total number	percentage	Total number	percentage
T.capitis	6	20%	15	50%
T.unigum	4	13.3%	5	16.7%
Total(30)	10		20	

Table (3): The relationship between dermatophytes infection and the area of residence

Table (3) results showed that most fungal skin infections are in people who live in rural areas due to the poor health status resulting from lack of attention and health awareness, low health care and the economic level help in the occurrence of skin fungi infection as far as it is stated [27,28,29,30]

5.Conclusion

Failure to classify or distinguish fungal infections in a large number of clinical samples suggested a deficiency in clinical diagnosis in differentiating dermatophytosis from other organisms induced skin infection. Direct microscopic analysis is characterized by a high sensitivity in dermatophyte presence detection and is a preliminary detection of fungi presence, dermatophytes infections are affected by the gender (sex factors) and the area of residence.

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Conflict of interest
there has been no conflict of interest of any kind with the authors of this work.

Ethical standard:
The study was formally approved the research plan by the ethical committee board at the Anbar health directorate.

Informed consent was taken from all the participant patients before being enrolled in the study. **All data and materials are available**

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