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DETERMINE THE INCIDENCE OF VARIOUS CLINICAL KINDS OF DERMATOMYCOSES AND DERMATOMYCOTIC MOULD INFECTIONS, AS WELL AS THE ETIOLOGICAL AGENTS

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Abstract:

Aim: *The illnesses of the skin and also its extensions generated with fungus are referred to as shallow mycoses. This research was undertaken since the pervasiveness of fungus can fluctuate from time to time.*

to determine the incidence of various clinical dermatomycoses including dermatomycotic mould diseases, as well as the etiological agents behind these diseases. The research comprised 570 medically confirmed instances of superficial mycoses that visited tertiary care facilities during a two-year period. Skin scrapings, nail clippings, and hair samples were gathered, mounted, and cultured using KOH. Macroscopic inspection of the culture, tease mount, slide culture, and the Germ tube examination were used to identify the species. Examining the Wood's light had also been done.

Methods: *Men (72.97%) and those in the age range of 21 to 30 years (34.23%) had more superficial mycoses than females. In dermatophytosis, tinea corporis 165/472 (35.76%) and tinea cruris 147/472 (31.93%) were the two most prevalent clinical types. Using direct microscopy, 54.05 percent of cases proved positive, and 63.8 percent of cases had positive cultures. Dermatophytes were identified in 81.12% of the 357 culture-positive cases, followed by yeasts (17.93%) and non-dermatophyte molds (4.97%). Trichophyton rubrum 158/287 (56.33%) was the most prevalent isolate amongst dermatophytosis. NDM included several Aspergillus species, Hortaea werneckii, Cladophialophora carrion, and Exophiala jeanselmei.*

Results: *It was discovered that non-dermatophytic fungi remain similarly developing as a significant source of superficial mycoses, in addition to dermatophytes. Exophiala jeanselmei and Cladophialophora carrionii are two uncommon NDMs that may have a causal role in tinea corporis. The illnesses of the skin and also its extensions generated with fungus are referred to as shallow mycoses. This research was undertaken since the pervasiveness of fungus can fluctuate from time to determine the incidence of various clinical dermatomycoses including dermatomycotic mould diseases, as well as the etiological agents behind these diseases. The research comprised 570 medically confirmed instances of superficial mycoses that visited tertiary care facilities during a two-year period. Skin scrapings, nail clippings, and hair samples were gathered, mounted, and cultured using KOH. Macroscopic inspection of the culture, tease mount, slide culture, also the Germ tube test were used to identify the species. Examining the Wood's light had also been done. Men (72.97%) and those in the age range of 21 to 30 years (34.23%) had more superficial mycoses than females. In dermatophytosis, tinea corporis 165/472 (35.76%) and tinea cruris 147/472 (31.93%) were the two most prevalent clinical types. Using direct microscopy, 54.05 percent of cases proved positive, and 63.8 percent of cases had positive cultures. Dermatophytes were identified in 81.12% of the 357 culture-positive cases, followed by yeasts (17.93%) and non-dermatophyte molds (4.97%). Trichophyton rubrum 158/287 (56.33%) was the most prevalent isolate amongst dermatophytosis. NDM included several* ***Conclusion:*** *Aspergillus species, Horatian Wernicke, Cladophialophora caring, and Exophilic. It was discovered that non-dermatophytid fungi are also developing by way of a significant source of superficial mycoses, in addition to dermatophytes. Exophilic gentlemen and Cladophialophora carinii are two uncommon NDMs that may have a causal role in tinea corporis.*

Keywords: *Shallow Mycoses, Pervasiveness of Fungus, Dermatomycotic Mould.*

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INTRODUCTION:

The term "superficial mycoses" describes a condition affecting the skin and also its attachments that are brought on by filamentous fungus as well as yeast [1]. Those fungi can manufacture keratinase, enabling them to break down and feed on human keratin found in the skin, nails, and hair. Pityriasis Versicolor, dermatophytosis, cutaneous Diflucan, and non-dermatophytid fungi would be further separated into these groups [2]. The fungal infiltration of keratinized tissue remains called dermatophytosis. One of the four asexual dermatophyte genera, trichophyton, Epidermophyton, or Microspore, is responsible for its development. They are filamentous, keratophakic, pathogenic fungi that may be classified as geophilic, zoophilic, or anthropophilic depending on their environment. Non-dermatophytes and yeast-like fungi may also cause skin or nail infections [3]. A growing variety of non-dermatophytid filamentous fungi have already been identified in recent years as sources of skin and nail infection in humans, causing lesions that are medically comparable to any of those brought on by dermatophytes [4].

Although there are many publications on dermatophytosis from various regions of the nation, there's many relatively little data from Pakistan's eastern area on non-dermatophytid fungi also yeast-similar fungi by means of the causes of insincere mycoses in addition to dermatophytes [5-8]. Skin mycoses are currently one of the most common of infections, affecting upwards of 21-27% of the worldwide population due to the surge in the incidence of superficial mycotic infections over the last several generations [9-12]. Geographical location, a broad variety of cultural and environmental variables, as well as the prevalence of dermatomycoses, their pathogenetic causes, and the predominating anatomical infection trends, significantly affect these variables [13].

The range of dermatophytes is dynamic regardless of geographical differences and propensities for dermatophyte diseases. Lesser common or forgotten creatures are being recruited and spread thanks to booming mass tourism, international sporting events, and rising migration [14]. This research could aid in discovering any as-yet-unrecognized evolving trends in this component of the illness since it aims to discover the species that cause dermatomycoses. Additionally, it could offer details on the prevalent epidemiological variables impacting the prevalence of this illness as well as the prevailing medical presentation. With this understanding, stronger preventative measures may be put in place to get rid of such a widespread fungal illness [15].

METHODOLOGY:

This was observational research with a cross-sectional design that was carried out over the course of two years in eastern Pakistan. A multispecialty hospital's Department of Microbiology worked in conjunction with both Outpatient Department of Dermatology, Venereology, also Leprosy to verify the diagnostic accuracy of superficial mycoses in 570 patients who had been randomly picked from the Inpatient Division of Dermatology, Venereology, and Leprosy. The diabetics had been typically diagnosed as needing superficial mycoses. An institutional independent commission reviewed the research and gave its blessing before it was carried out. Detailed patient history was taken into account. Individuals who refused to take part in the trial and patients who had a history or documentation proof of anti-fungal therapy during the previous three months weren't really allowed to participate in the research. The patient was presented with information on the treatment, and their signed informed permission was obtained before the extraction of the specimen. On a little piece of the white paper envelope, the diagnostic specimens (such as a scraping of the skin, diseased hair removed by plucked, and clipped nails) have been gathered. The nail clippings were subsequently soaked in a solution containing 42% KOH overnight before being examined the following morning. The 11% KOH mount examination was carried out as soon as the sample was collected.

One month of incubation at temperatures of 27 and 38 degrees Celsius was required to get a negative response from cultures. In the event that any proliferation was achieved, it must have been identified grounded on the colony features, pigment manufacture, microscopic appearances on lactophenol cotton blue teased mount, slide culture, urease test, hair penetration test, also spore germination examination. Whenever non-dermatophyte molds were found, a second culture was carried out in order to exclude the possibility of contamination.

The median age as well as the relative frequency of diagnostic and mycological information were both reported in percentages. The spreadsheet program Microsoft Excel was used to compile and analyze all of the replies. Employing descriptive and inferential statistics, an examination of the information was carried out.

RESULTS:

The overwhelming of the 570 individuals who contributed in our research remained among the ages of 22 and 31 years old (34.23 percent), and 72.93 percent of the cases have been a man. The patients diagnosed remained female. The number of men to women was 3.7 to 1. Dermatophytosis was found to be present in 84.76 percent of the 570 patients, accompanied followed pityriasis Versicolor (9.04 percent), candidiasis (8.87 percent), and tinea nigra (0.37 percent) (Figure 1). The plurality of instances of cutaneous mycoses reported found in metropolitan areas (82.95%), particularly those belonging to middle economic classes (84.22%). In 21% of instances, there had been a background of interaction with just a spouse or individual who was afflicted with the disease. Individuals who could read and write (73.55%) remained more likely to be impacted than those who could not (25.45%). Scholars made up approximately 33.16 percent of those who were impacted, making them the profession with the highest percentage. In this particular investigation, out of 468 complete diagnostic techniques of dermatophytosis, 32.76% of patients were t. Corporis, accompanied by t. cruris (31.93%), and the examples with the lowest prevalence were t. manuum (3.78%) and t. faciei (3.78%), preceded by t. barbae (1.93%). There were 96 cases of various web infections, including t. corporis being the most frequent type and t. cruris accounted for 79 (83.11%) of the cases.

In a total of 48 cases of candida albicans, the monilial balanoposthitis diagnostic category were the most prevalent, accounting for 34.37 percent of the patients. On the other end of the spectrum were the erosio interdigitalis blastomycetica diagnostic category (3.28%), and the median rhomboid glossitis diagnostic form (3.28%). KOH positive was detected in 298 (54.05%) of the patients, and fungal isolates have been obtained from 353 (63.84%) of the cases with superficial mycoses. In associated to KOH mount, the likelihood of a culture being positive was greater in instances of dermatophytosis and candidiasis than in those with pityriasis versicolor. On culture, both instances of Tinea nigra exhibited proliferation, but neither case tested positive for KOH (Figure 2).

There were 193 (35.27%) instances of KOH-positive patients that also demonstrated culture positivity. KOH showed positive, but the culture came out negative in 105 (17.37%) of the cases. As is shown in Table 1, 162 (or 29.76%) of the samples tested negative for KOH but successful for culture. In 356 instances where the cultures came out affirmative, dermatophytes have been identified in 81.12% of them, trailed with yeasts (16.92%) and non-dermatophyte moulds (4.95%). (Table 2). Trichophyton (278/284, or 98.53%) constituted the most often isolated genus, while T. rubrum (157/278, or 52.74%) constituted the most common species within it (Figure 2). This has been trailed by T. Mentagrophytes (97/276, or 36.63%).

In 358 instances where the cultivation was positive, dermatophytes were identified in 81.12% of them, trailed by yeasts (16.92%) and other moulds (4.95%). (Table 2) Trichophyton was the genus that was isolated the most frequently with 278 out of 285 samples, or 98.53 percent. Within this genus, T. rubrum were the most common species, with 157 out of 276 samples, or 57.74 percent (Figure 3), second by T. Mentagrophytes (94/278 samples, or 34.62%). A total of 56 samples, or 16.90% of the total, tested positive for the presence of yeast isolates. Of these, Candida has been found in 37 (11.24%) of the samples, while Malassezia has been found in 21 (6.65%) of the samples. The species of Aspergillus constituted the most often found NDM.

Table 2 demonstrates that the most prevalent isolate in this investigation included T. rubrum (54.16%), which was mostly separated from T. corporis, T. cruris, and T. unguium patients. T. mentagrophytes was really the second most frequently encountered isolate, accounting for 35.74 percent of all cases. This fungus was shown to be most prevalent in cases of t. cruris and t. corporis, followed by t. capitis and onychomycosis. Microsporum spp. have been able to be cultured from t. corporis, t. cruris, t. pedis, and t. capitis, yielding a total of nine isolates (3.57%). In the

inspection with Wood's lamp, 43.45% of Pityriasis versicolor patients displayed fluorescence, with yellow fluorescence (25.68%) being the most prevalent.

Table 1:

Mycological isolates	**Percentage (%)**	**No. of isolates**
Trichophyton mentagrophyte	56.33	157
Trichophyton rubrum	35.76	99
Microsporum audouinii	5.27	13
Trichophyton violaceum	3.49	8
Trichophyton schoenleinii	2.78	6
Trichophyton tonsurans	2.43	5

Table 2:

	Culture, no growth	**Culture, growth**	**Total**
KOH negative	104 (18.39)	161 (28.57%)	264 (46.96%)
KOH positive	106 (18.75%)	193 (34.29%)	298 (53.04%)
Total	210 (37.14%)	354 (62.86%)	562 (100%)

Figure 1:

Figure 2:

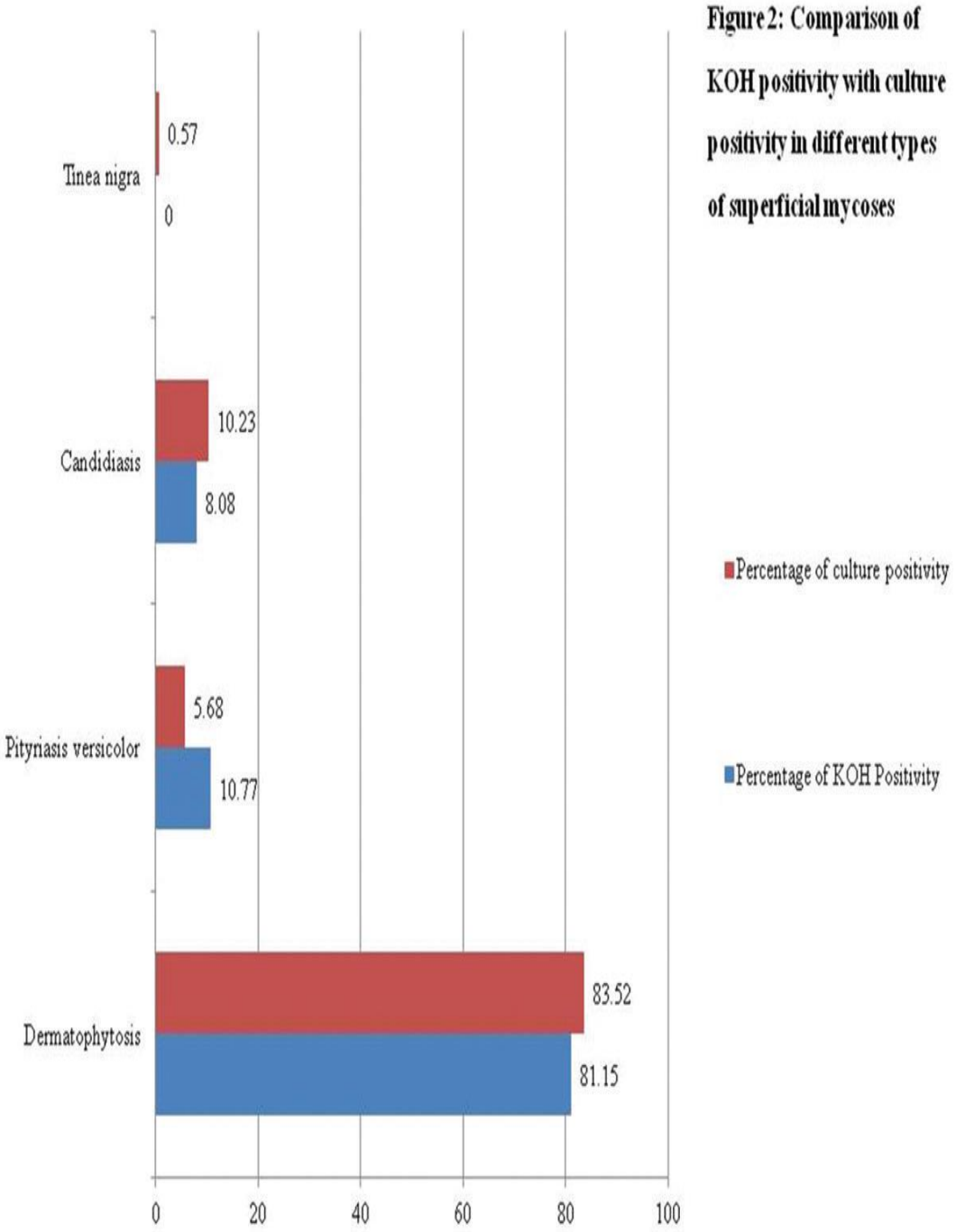

Figure 2: Comparison of KOH positivity with culture positivity in different types of superficial mycoses

DISCUSSION:

People who suffer from superficial mycoses make up a significant portion of those who visit the dermatology outpatient department at our tertiary care hospital. The increased warmth, in combination with perspiration from the body, is conducive to the development of fungi [16]. Not only is the detection of the fungal agent important for treatment, but it is also important for epidemiology. The current investigation found that men were just more likely to be impacted than females. The number of males to females was 3.7 to 1 [17]. Previous research has shown similar conclusions, with one notable exception: one Egyptian study found a higher ratio of female participants to male participants. According to the findings of our research, the age group ranging from 22 to 31 years old (34.24%) was the most often impacted age group, followed by the adult age group. This conclusion has a strong connection to previously conducted research [18]. The patients came from metropolitan areas an overwhelming majority (82.95%), as opposed to rural areas (19.05%). This might be because the air in urban areas has higher relative humidity than the air in rural areas, or it could be because our research center is so easily accessible to metropolitan areas. A positive history of interaction with an infected spouse or other sick people was found in 21% of the 570 individuals who were treated [19-24].

In our research, dermatophytosis was the most prevalent clinical form of superficial mycoses, accounting for 84.76 percent of the patients. Following these were candidiasis (8.83%), pityriasis Versicolor (9.04%), and two cases of tinea nigra (0.37%). That investigation is identical to that done in Punjab by Kannan and colleagues. But according to studies done in Lahore by Bharbuiya et al., candidiasis is the most common clinical form, right after dermatophytosis [25]. Pityriasis Versicolor was identified being the most typical condition in a study carried out in Multan by Mishra et al. The research includes numerous examples of tinea nigra, whereas Kannan et an investigation .'s only contained one. Tinea corporis has been found to be the most frequent clinical form of dermatophytosis, according to the results of our research (35.76%), trailed by tinea cruris (31.93%) [26-29]. These findings are consistent with overall data from other regions of Pakistan. In the current research, the frequency of tinea capitis reached 4.02%, which is in line with the reports that have been received from other employees. Tinea capitis is seen in India much less often than in other nations. It is possible that this is because Pakistani traditionally utilize hair oils, that have been proven to have an inhibiting impact on dermatophytes when tested in vitro. Hair oils are often used by Pakistanis. In the latest research, the frequency of onychomycosis was found to be 16.26%, which would be equivalent to research conducted in Peru (25%), but higher than research conducted in Lahore (9.12%) [30].

The prevalence of toenail fungus on the feet has been estimated to range from 0.5% in Ahmedabad to 23.5% in Peshawar. It tends to be on the higher side in the western part of the nation. According to this survey, it was 2.65 percent. This might be due to the fact that people often wear shoes and socks, which increases the risk of both sweat and maceration [31]. In our research, the rate of multiple site contamination reached 21.27%, that is almost comparable to the research that was carried out by Grover et al. (18.4%) in Karachi, but it was lower when compared to the study that was carried out by Mishra et al. (26%). Tinea cruris coupled through tinea corporis remained observed in 15.94% (79/570 cases), which is a greater percentage than what was reported in a research carried out in the desert area of Rajasthan (12.45%). This condition was the most prevalent [32].

The crotch was the most prevalent region afflicted by dermatophytosis, whereas the beard area and the neck were the least common areas. It's possible that this is because of tight clothes in the groyne region. In the current research, the most prominent psychological form of candidiasis was balanoposthitis, which accounted for 32.35% of cases, followed by intertrigo, which accounted for 35.07%. When compared to this, the most frequent case of intertrigo was found in the study by Bar Bhuiya et al. from Karachi, whereas the most common case of oral candidiasis was found in the research by Kannan et al. from Karachi [33].

In compared to other diagnostic approaches, the KOH treatment has shown very high levels of specificity. The KOH validity rate was identified to be 54.05%, and the culture positivity rate was identified to be 63.84% in our research. This research is consistent with the findings of the previous studies conducted in different regions of Pakistan. On the other hand, other investigations have shown a rather high rate of KOH positive [34-37]. Our research's prevalence of culture positive was similar to that found in the survey performed in the KPK province. Differences in KOH also culture might remain consequence of a number of different contributing elements that were implicated in the collecting, transporting, inoculating, and incubating of the material. It's possible that some of the action depends include the limited amount of sample substance, the lack of an infected individual in example, also differences in the pH also sensitivity of

the medium utilised. In current research, KOH positivity was shown to be less important than cultural positivity. It's possible that the fungus is to blame for this [38].

There was a total of 170 instances where the KOH test came back negative but the culture came back positive. Other researchers have come to the same conclusions, which are consistent with ours. The drying out process may provide an explanation for this phenomenon. The current research found that Trichophyton genera were the most prevalent kind of dermatophytes (95.53%), with T. rubrum being the most popular method and T. mentagrophye being the second most common type. Trichophyton species remained supplementary normally remote than Epidermophyton also Microsporum, despite Trichophyton rubrum being the primary dermatophyte that has been described from Pakistan and other nations. According to a few research conducted in India, T. mentagrophye was shown to be the most frequent dermatophyte isolate, followed by T. rubrum. In our investigation, the percentage of dermatophyte T. rubrum isolates that were T. rubrum remained 56.34%, however in a survey performed in western Odisha in 2018-2019, the percentage of T. rubrum isolates that were T. rubrum exceeded 75%. Researchers were only able to isolate T. rubrum, T. mentagrophytes, T. violaceum, T. schoenleinii, T. tonsurans, and M. audouinii. Additional researchers have identified plenty of additional species of dermatophytes, such as T. schoenleinii, T. verrucosum, T. ferrugineum, T. concentricum, and M. audouinii. In the current study, T. rubrum had been found to be the primary cause of tinea corporis, tinea cruris, and tinea unguium. T. mentagrophyte had been found to be the primary cause of tinea pedis and tinea capitis. However, in a previous study, E. floccosum had been found to be the primary cause of tinea cruris, and T. violaceum must have been found to be the primary cause of tinea capitis. Different environmental conditions and regional distributions might be to blame for this phenomenon [39].

CONCLUSION:

According to the findings of current research, viral pathogens continue to be one of the most used skin infections. This intervention is significant in the second decade and normally in men. Furthermore, the groin is the most frequent occurrence of dermatophytosis when viewed from the vantage point of engagement. It is essential that careful consideration be given to the kinds of clothes worn and the upkeep of personal hygiene. It has been shown that mushroom cultivation is more responsive than KOH testing. Molds that are not dermatophytes may also be responsible for shallow mycosis, in addition to dermatophytes. Therefore, identifying the species of the fungus is extremely critical in order to begin timely and suitable antifungal treatment.

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