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Clinico-Dermoscopic Consensus in Patients of Scabies presenting in a Tertiary Care Hospital

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ABSTRACT

Objective: To determine the concordance between clinical and dermoscopic findings in patients of scabies.
Study Design: Cross-Sectional Study.
Place and Duration of Study: Dermatology Department, PNS Shifa Hospital, Karachi Pakistan, from Jun 2022-Dec 2022.
Methodology: All patients visiting Dermatology Outpatient during the study period with history of itching and age ranging from 18-50 years of either gender were included in this study after obtaining prior informed consent. Dermoscopic findings were recorded using HIEINE DELTA 20T dermoscope, captured at 10-16x magnification under standardized conditions of color and light, and stored using a 40-megapixel mobile camera for further investigation.
Results: The age of patients ranged from 18 to 50 years with a median of 28.0(10.0). In the distribution of gender, 119(69.6%) were male while 52(30.4%) were female. Concordance between clinical and dermoscopic findings was noted in 91 patients (53.21%).
Conclusion: Insignificant concordance was noted between clinical and dermoscopic findings among clinically suspicious patients of scabies.

Keywords: Dermoscopy, Pruritus, Scabies.

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INTRODUCTION

Scabies is a contagious skin infestation caused by a mite called Sarcoptes scabiei. It is estimated that more than 200 million people are affected worldwide at any given time. The estimated prevalence in the current scabies literature ranges from 0.2% to 71%.[1] It is usually observed with itching at night time and skin burrows can be seen with the naked eye. Diagnosis of scabies rests largely on patient history and clinical examination. The clinical diagnosis lacks specificity because the clinical manifestations are similar to other common skin diseases for instance bacterial skin infections, eczema etc. As a major public health problem in developing and underdeveloped countries, misdiagnosis leads to spread among close contacts, making treatment and eradication difficult.[2]

Common methods of confirming a diagnosis of scabies include skin scrapings followed by microscopic identification of mite, burrow ink test, adhesive tape test, shave biopsy and PCR.[3] Microscopic identification of mite obtained through scrapings from appropriate sites is usually recommended,[4] but is not always practical. A simple, inexpensive, sensitive and specific test to routinely diagnose active scabies is essential for early detection and, therefore, treatment of the disease. Since most of the procedures of identification of in vivo mites are invasive,[3,4] it is not always practical to do microscopic identification especially when clinical findings of scabies patients are atypical such as in immunocompromised patients. Moreover, many of these patients do not adhere to diagnostic procedures. A minimalistic number of parasites in skin scrapings can also be a factor in the low yields of these tests. In such cases, new methods such as epiluminescence microscopy and dermoscopy can help detect scabies. The use of a pocket handheld dermoscope with 10x magnification is a non-invasive, sensitive, and specific tool for diagnosing scabies.[5,6]

A dermoscope is a handheld device that provides a magnified image of the skin to visualize mites. The advantage of dual availability of magnification and light in dermoscope renders the skin's top layer translucent, thus enhancing visualization of skin layers down to the superficial papillary dermis and increasing the reliability of clinical inspection. The usage of dermoscopy for the identification of scabies was first reported in 1997 by Argenziano *et al*. for in vivo detection of gross scabies mite.[7] Since then, several studies have been conducted internationally using dermoscopy to diagnose scabies and compare it

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with other methods such as skin scrapings and tape tests. Dermoscopy for scabies has a sensitivity of 91% and a specificity of 86%.[4] The scabies mite structure can be divided into three parts, the “head” hosting the mite, the "body" which clinically represents as burrow that appears white containing eggs and feces of the parasite and the "tail" which is the terminal part of the mite and appears as an incomplete structure made of keratin collarettes.[8] On 10x magnification, the most commonly visualized part of a scabies mite is the “Head” which is seen as a triangular structure characteristically a "delta wing jet sign” in 98% of cases.[9] A mite head can also be seen as a triangular structure representing the head along with two pairs of front legs of the mite (French letter "ô"). Moreover, “jet with contrail sign” can also be seen on higher magnifications, which again represents the head part with a burrow seen as whitish structureless lines in the background. Positive dermoscopy was seen in 49.5% of clinically diagnosed scabies in a recent similar study hence a perfect degree of agreement was established between clinical diagnosis and dermoscopy of scabies.[10]

The aim of this study was to determine concordance between clinical diagnosis and dermoscopic findings in scabies patient; hence utilizing this technique as a rapid outpatient tool for diagnosing scabies as currently the most rapid method was mite extraction which is not always practical and needs expertise. Moreover, mite extraction is bothersome for patient as well while dermoscopy is a non-invasive, efficient technique with minimal discomfort to the patient.

METHODOLOGY

The cross sectional study was conducted at the Dermatology Department, PNS Shifa Hospital, Karachi from Jun to Dec 2022. The study was conducted after permission from Ethical Review Committee of PNS shifa, Karachi (ERC/2021/DERMATOLOGY/63 dated 21/12/2021).

Inclusion Criteria: Patients of either gender with age ranging from 18 to 50 years, visiting dermatology outpatient with history of itching were included.

Exclusion Criteria: Treated or partially treated patients for scabies and patients who were taking topical or systemic steroids for any other skin disease were excluded.

Patients presenting with generalized itching with nocturnal exacerbation, family history of itching, and presence of typical burrows fulfilled the clinical diagnostic criteria of scabies. Sample size was calculated WHO sample size calculator taking reported concordance between the clinical diagnosis and dermoscopy of scabies 47.1%.[10] The estimated sample size came out to be 171. Sample was taken through non-probability consecutive sampling technique.

All patients participating in the study underwent dermoscopy of the suspect areas with special focus on Interdigital burrows, abdomen, and groin. To minimize the risk of cross-infection, contact dermoscopy was performed and the dermoscope was disinfected with alcohol swabs after each use. Due to patient privacy concerns, female patients were examined by female investigators of relevant specialties. Dermoscopic findings were recorded with HIEINE DELTA 20T dermoscope and saved for further examination with a 40-megapixel mobile camera. Dermoscopic images were captured at 10x-16x magnification under standardized conditions of color and light. Higher magnification can be achieved by extending the camera's optical zoom (usually around 3-5x) and by viewing the image (jpg file) in full format in post-production. Recorded lesions were thoroughly evaluated by a dermoscopy specialist (consultant dermatologist with special interest in dermoscopy having attended short dermoscopy courses). Both clinical and dermoscopy examinations were performed by single investigator and recorded on predesigned proforma. The presence of some or all dermoscopic features in patients with clinically diagnosed scabies, or the absence of dermoscopic features in patients not meeting clinical diagnostic criteria, was considered a positive concordance. The absence of dermoscopic features in clinically diagnosed cases or the presence of dermoscopic features in patients not meeting clinical diagnostic criteria was termed discordance. Confounding variables and bias were controlled by strict adherence to inclusion criteria.

Data was analyzed with Statistical Package for the social sciences (SPSS) version 23:00. Age and duration of symptoms were expressed as the mean and standard deviation, or the median interquartile range if the distribution was not normal. Data normality was assessed using the Shapiro-Wilk test. Frequencies and percentages for sex, presence or absence of dermoscopic features, and concordance were calculated. Association between the clinical findings of scabies and dermoscopy was calculated using the chi-square test. The p-value of ≤ 0.05 was considered significant. Kappa analysis was performed

to assess concordance between clinical and dermoscopic findings.

RESULTS

Positive dermoscopic features were noted in 93 patients (54.4%) out of those 58(33.9%) were also positive clinically (true positives) (Table-I). Concordance between clinical and dermoscopic findings (sum of true positives and true negatives) was noted in 91 patients (53.2%). Patients meeting the diagnostic criteria of scabies were 103(60.2%) while patients not meeting the diagnostic criteria were 68(39.7%). The age of the patients ranged from 18 to 50 years with a median of 28 and interquartile range 10. In the distribution of gender, 119(69.6%) were male while 52(30.4%) were female. Among the dermoscopic features noted in scabies patients, the mite head was the most common part visualized followed by the head and body while the least common part visualized is the eggs and feces of mites as shown in Table-II. "Jet with contrail sign" representing the head part of mite along with its burrow seen as whitish structureless lines in the background was seen in 29.3% of patients with clinically diagnosed scabies patients as shown in Figure. Negative dermoscopic features were noted in 78 patients (45.6%) out of those 33(19.3%) were also negative clinically (true negatives) as shown in Table-III.

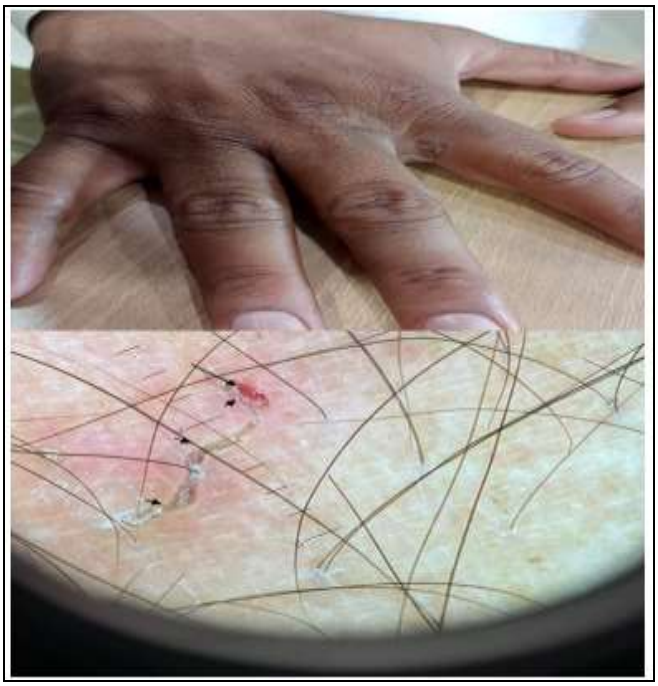

Figure: (a) Typical scabies burrow (b) Jet with contrail sign (further magnified view from the camera) long arrow showing the triangular head, short arrows showing burrow forming typical contrail appearance

Table-I: Distribution of Dermoscopic features (n=171)

Dermoscopic Features	n(%)
Mite head alone	44(25.7%)
Head and body	19(11.1%)
Only body of mite	14(8.1%)
Head and eggs	11(6.4%)
Only eggs and feces of mite	5(2.9%)
No Dermoscopic features	78(45.6%)

Table-II: Distribution of Dermoscopic Features in Clinically Diagnosed Scabies Patients (n=58)

Dermoscopic Features	n(%)
Mite head alone	26(44.8%)
Head and body "Jet with contrail sign"	17(29.3%)
Only body of mite	8(13.7%)
Head and eggs	5(8.6%)
Only eggs and feces of mite	2(3.4%)

Table-III: Frequency of Concordance between Clinical and Dermoscopic Findings (n=171)

Clinical Findings of Scabies	Dermoscopic Findings of Scabies		*p*-value
	Yes	No	
Yes	58(33.9%)	45(26.3%)	0.534
No	35(20.5%)	33(19.3%)	

DISCUSSION

Dermoscopy, originally introduced to diagnose pigmented lesions and melanoma, was additionally used as a noninvasive accessible device for the diagnosis of many skin diseases,[11,12] including scabies in vivo.[13] A number of international studies have used dermoscopy to diagnose scabies and compared it with other methods such as skin scraping and tape testing.[14] In two similar studies by Park *et al*., and Lee *et al*.[15,16] Park *et al*. showed concordance between dermoscopy and clinical diagnosis in his 83.67% of patients. However, the primary purpose of this study was to compare skin scraping with and without dermoscopy. Skin scapings "with dermoscopy" was found to be more accurate and faster in diagnosing scabies than skin scrapings "without dermoscopy". Furthermore, the sample size of this study was very small at 49 individuals. The study also concluded that dermatoscopy is particularly useful for diagnosing scabies incognito, although these patients fell into the exclusion criteria of our study.

There is sparse locally published literature on the use of dermoscope to diagnose scabies. Only one study conducted by Kafayat *et al* in 2019 determined the degree of concordance between clinical and dermoscopic diagnoses in patients with scabies.[10] In the study by Kafayat *et al*, positive dermoscopy was established in 49.5% of scabies patients. In our study, it

was in 54.4% patients but that was actually the sum of true positive cases (33.9%) and false positive cases (20.5%) i.e. patients who did not meet clinical criteria of scabies but with positive dermoscopic findings. Of note, our study enrolled both scabies and non-scabies patients in order to further validate the dermoscopic findings of scabies. This makes our study one of its kind by identifying false positive cases of scabies dermoscopy.

In the same study by Kafayat *et al*, the most frequently visualized part was mite head in 62.5% patients while least visualized part was body in 0.9% patients, which is comparable to our study i.e mite head in 17% and body in 5.3%. Nie *et al* in china[17] found "Jet with contrail" sign in 89.3% of confirmed scabies children with the help of a 50x lens. Our study established this sign with the help of even lower magnification of dermoscope i.e. 16x in 29.3% of scabies patients. Obviously the yield of this sign is low but still it can be seen on low magnification dermoscope by extending the camera's optical zoom and post-production of the image in full format. Although dermoscopy seems to have all the qualities required for a good diagnostic test in scabies,[18] a few of its limitations probably having a confounding effect on our study are worth addressing At a low magnification of 10x, it is not possible to clearly distinguish between "Jet with contrail" sign and artifacts caused by itching and excoriation of skin or small dirt particles. Furthermore, low magnification makes it impossible to visualize eggs and feces, which are often the only clues.[19] The "jet with contrail" sign can hardly be seen on darker skin tones, undermining the effectiveness of dermoscopy in many countries like ours. Additionally, hairy areas of the body make it difficult to clearly visualize the skin with a dermoscope.[20] Dermoscopic examinations are highly operator dependent. Therefore, it is important that the operator is properly trained and has sufficient expertise to take advantage of the instrument's diagnostic capabilities. There is a great need for image databases with such dermoscopic nomograms for specific sites and skin types in order to minimize errors in the interpretation of dermoscopic structures.

Finally, it has been suggested that using a hand-held dermaoscope in or around the genital area may cause discomfort due to the close contact between the observer's head and the patient's skin.

CONCLUSION

It is to be concluded that insignificant concordance was noted between clinical and dermoscopic findings among clinically suspicious patients of scabies. However, dermoscope remained to be a non-invasive handy tool for preliminary diagnosis of scabies patients. Further large-scale work is recommended with larger sample size in multiple study centers in Pakistan for validation of current findings.

Conflict of Interest: None.

Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

MU & TM: Conception, study design, drafting the manuscript, approval of the final version to be published.

NA & AB: Data acquisition, data analysis, data interpretation, critical review, approval of the final version to be published.

FH & HMF: Conception, data acquisition, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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