



COMPARATIVE STUDY OF DERMOSCOPY, SKIN SCRAPING, AND THE ADHESIVE TAPE TEST FOR THE DIAGNOSIS OF SCABIES IN A TERTIARY HEALTH CARE CENTER, UTTAR PRADESH

Dermatology

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ABSTRACT

Background & Aims: Scabies is a parasitic skin disease endemic in resource-poor communities. The best ways to diagnose scabies in this setting have not been investigated. To compare study of dermoscopy, skin scraping, and the adhesive tape test for the diagnosis of scabies in 120 patients.

Methods: A comparative study was done in 120 patients, the patient were divided in 3 equal groups, and each group were subjected to be examined by one of the modalities i.e. Dermatoscopy, skin scraping and adhesive tape test. The patient then were examined dermoscopically. After the dermoscopy, the adhesive tape test was performed and a skin scraping was obtained. Skin scrapings and adhesive tape test was transferred to a glass slide and examined. Dermoscopy, skin scraping, and the adhesive tape test was performed at 3 topographic areas where mites were suspected. If the patient had more than 3 suspicious lesions, the selection of sites was left to the discretion of the investigator. If the patient had 3 or fewer lesions, all lesions were examined. For technical reasons, although conducted at the same body area, the adhesive tape test and the skin scraping was performed on different but closely located lesions.

Results: In total, 44 of 120 patients (36.3%) were diagnosed with scabies.

- The dermoscopy sensitivity was significantly higher then that of skin scraping and the adhesive tape test (both P .001) The specificity of dermoscopy was low (0.46; 95% CI, 0.34-0.58) and significantly less than that of the adhesive tape test and skin scraping (both P .001).
- Dermoscopy and the adhesive tape test had the same negative predictive value (0.85; 95% CI, 0.69-0.94 and 0.75-0.91, respectively).
- The sensitivity of dermoscopy and the adhesive tape test according to clinical characteristics of the patients. The sensitivity of both tests decreased with increasing duration of the infestation.
- The sensitivity of dermoscopy increased parallel to the severity of scabies (light scabies, 0.80; moderate scabies, 0.85; and severe scabies, 0.93); however, the differences were not significant.

Conclusion: When trained personnel are available, dermoscopy is a valid tool for diagnosing scabies in a resource-poor setting. The adhesive tape test is easy to perform and, because it has high positive and negative predictive values, the test is ideal for screening purposes. Skin scraping cannot be recommended as a diagnostic tool in this setting.

KEYWORDS

Skin scraping and standard superficial skin biopsy, Confidence interval.

INTRODUCTION

Scabies is a common skin condition, caused by the ectoparasite *Sarcoptes scabiei* var. *hominis*.^{1,2} Transmission in general is by close personal contact, sexual or otherwise, or, less frequently, indirectly via fomite transmission such as on clothing or bed sheets.^{3,4,5}

Adult female parasites (length: 0.3–0.5 mm) dig tunnel-like burrows (length: 1–10 mm) within the superficial layers of the epidermis, producing what are often pathognomonic clinical signs of the disease, and lay approximately 2–3 eggs daily.

An infested subject host approximately 10–15 adult female mites on the entire body. *Sarcoptes scabiei* can survive outside of the host for up to 24–36 hours. The burrows are typically located on the interdigital spaces, the flexure surface of the wrist, axillae, umbilicus, belt line, nipples, buttocks, and penile shaft.

MATERIAL & METHODOLOGY

A prospective randomized control trial was conducted at SIMS, Hapur after obtaining ethical committee approval and written informed consent of patients.

Study Duration: Two years (September 2020 to August 2022)

Study Design: An Observational study.

Inclusion Criteria

- Age >12 years
- All suspected Patients visiting OPD/ IPD with itching for at least 1 week or with characteristic primary lesion (papules, vesicles, or nodules) with or without secondary lesions (excoriation, eczematization, or secondary bacterial infection)

Exclusion Criteria

- Pregnant women
- All the other causes of itching except scabies
- Patient already taken treatment within last 1 month.

METHODOLOGY

- After taking approval from Institute's Ethical committee, the study was initiated.
- Patients presented to the dermatology department of Saraswathi Institute of medical sciences were screened for scabies.
- A detailed history was taken, and physical examination was done in all patient.
- All patients were examined in a well-lighted room of the department.
- Among 120 patients, the patient were divided in 3 equal groups, and subsequently each group were subjected to be examined by one of the modalities. i.e- Dermatoscopy, skin scraping, and adhesive tape test.
- Patients were randomized in Group A, Group B, Group C

Group A (n=40) Dermoscopy was performed using a handheld dermatoscope with ×10 magnification) The “delta wing sign” was considered to indicate the presence of a mite

Group B (n=40) Transparent adhesive tape was cut into strips of the size of a microscope slide (25 x 50 mm), firmly applied to a lesion, and then pulled off rapidly. The tape was transferred to a slide and the slide was stored at 10°C to 14°C until it was read. Slides were examined within the next 3 hours. Slides was scanned at ×40 magnification. If a mite will be suspected, the magnification will be increased to ×100.



Figure 1: Dermoscopy



Figure 2: Skin Scraping



Figure 3: Adhesive Tape Test



Figure 4: Burrows On Dermatoscope

Group C (n=40) Skin scrapings was obtained with the sharp edge of a sterile scalpel after the application of 1 drop of silicone oil onto the lesion. The scraped material was transferred to a slide and covered with a coverslip. The edges were sealed with transparent nail polish. Slides were kept in a refrigerator at 10°C to 14°C until examination. Reading was performed within 3 hours at $\times 40$ magnification.

Statistical Analysis

- Statistical testing was conducted with the statistical package for social science (SPSS) version 26.0
- Continuous and categorical variables were identified to find out Frequency Distribution Mean and Standard Deviation accordingly.
- To observe statistical significance chi square test, t-test was conducted.
- Value less than 0.05 level been considered significant.

RESULT

In total, 44 of 120 patients (36.3%) were diagnosed with scabies. The diagnostic properties of the 3 tests are shown in Table 9. The sensitivity of dermoscopy was significantly higher than that of skin scraping and the adhesive tape test (both $P < .001$). By definition, the specificity and the positive predictive value of the adhesive tape test and of skin scraping were each 1.00. The specificity of dermoscopy was low (0.46; 95% CI, 0.34-0.58) and significantly less than that of the adhesive tape test and skin scraping (both $P < .001$). Dermoscopy and the adhesive tape test had the same negative predictive value (0.85; 95% CI, 0.69-0.94 and 0.75-0.91, respectively).

Diagnostic property	Dermoscopy	Adhesive tape test	Skin scraping
Sensitivity (TP/TP+FN)	0.83 (0.70-0.94)	0.68 (0.52-0.81)	0.46 (0.31-0.62)
Specificity (TN/TN+FP)	0.46 (0.34-0.58)	1.00 (0.94-1.00)	1.00 (0.94-1.00)
Negative predictive value (TN/TN+FN)	0.85 (0.69-0.94)	0.85 (0.75-0.91)	0.77 (0.67-0.84)
Positive predictive value (TP/TP+FP)	0.47 (0.36-0.59)	1.00 (0.85-1.00)	1.00 (0.79-1.00)
Mean accuracy (TN+TP/TN+TP+FN+FP)	0.60	0.88	0.81

DISCUSSION

This prospective and comparative study was carried out to determine the favorable treatment modality for patients suffering from scabies. One hundred and twenty patients with Scabies were selected purposively from Department of Dermatology of Saraswathi institute of medical sciences during the period of December 2020 to November 2022 with aim to study of dermoscopy, skin scraping and the adhesive tape test for the diagnosis of scabies in Tertiary Care Center, Uttar Pradesh.

Age of 120 patients ranged from 12 to 52 years. Mean age of the study population was 27.66 years and standard deviation 13.213 years. 52.2% patients were males and 47.8% patients were females.

Scabies was most common in lower socioeconomic group in our study group and more common among urban area. The probable reason would have been overcrowding and poor sanitation. Correspondingly, in the study by Dupuy et al,²⁰ the accuracy of dermoscopy substantially increased for untrained observers during the study period. If a trained dermatologist is not available, then the adhesive tape test is the method of choice.

CONCLUSION

- We utilized 3 methods of Dermoscopy, Skin scraping, Adhesive tape test to diagnose scabies in cases.
- It was found that dermoscopy test had the highest sensitivity. Further, the sensitivity of Dermoscopy increased with increase in severity of disease.
- The study suggests that the best method is Dermoscopy followed by Adhesive tape test, followed by Skin scraping, on the basis of sensitivity of the test to diagnose scabies.
- When trained personal are available, dermoscopy is valid and better tool for diagnosis of scabies in resource-poor setting.
- The adhesive tape test is easy to perform and because it has high positive and negative predictive values, the test is ideal for screening purposes.
- Skin scraping cannot be recommended as a diagnostic tool in this settings.
- It is suggested that a combination of dermoscopy and adhesive tape test would yield the best results.

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