ORIGINAL RESEARCH

Study of diagnostic predictability of dermoscopy over clinical diagnosis in common clinically-diagnosable outpatient dermatological diseases

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ABSTRACT
Objective: To evaluate the diagnostic predictability of dermoscopy compared to clinical diagnosis for common dermatological conditions encountered in outpatient settings. **Methods:** A cross-sectional observational study was conducted on 110 patients presenting with various outpatient dermatological conditions, including basal cell carcinoma, seborrheic keratosis, actinic keratosis, psoriasis, and eczema. Each patient underwent both a clinical examination and a dermoscopic evaluation. Diagnostic outcomes, including accuracy, sensitivity, and specificity, were compared between clinical diagnosis alone and dermoscopy-assisted diagnosis. **Results:** Dermoscopy increased diagnostic accuracy from 74.5% (clinical diagnosis) to 87.3%. Sensitivity improved from 78% to 90%, and specificity rose from 70% to 85%. Condition-specific improvements were noted, with seborrheic keratosis accuracy increasing from 75% to 95% and basal cell carcinoma accuracy from 80% to 92%. Dermoscopy also reduced unnecessary biopsies by 20 cases and increased clinician confidence in 80% of cases with initially uncertain diagnoses. **Conclusion:** Dermoscopy significantly enhances diagnostic accuracy, sensitivity, and specificity in outpatient dermatology, reducing diagnostic ambiguity and unnecessary procedures. These findings support the integration of dermoscopy as a standard adjunct in routine dermatological assessments to improve diagnostic precision and patient care outcomes.

Keywords: Dermoscopy, Diagnostic Accuracy, Clinical Diagnosis, Outpatient Dermatology, Sensitivity, Specificity, Basal Cell Carcinoma, Seborrheic Keratosis, Actinic Keratosis, Psoriasis, Diagnostic Confidence, Non-invasive Diagnosis

INTRODUCTION

In dermatology, precise diagnostic approaches are essential to ensure accurate and effective treatment. Many dermatological conditions present with similar clinical features, making differential diagnosis challenging, especially in outpatient settings where clinicians may encounter a variety of skin conditions daily. Traditionally, dermatologists have relied on clinical experience, visual examination, and patient history to diagnose conditions, yet the limitations of these approaches can lead to misdiagnoses or delayed treatment [1]. Dermoscopy, a diagnostic technique that utilizes handheld devices to enhance visualization of skin lesions and reveal subsurface structures not visible to the naked eye, has emerged as a valuable tool for improving diagnostic accuracy [2]. This study evaluates the effectiveness of dermoscopy in predicting diagnoses of commonly seen outpatient dermatological conditions and compares its predictive capabilities to those of standard clinical diagnosis alone [3].Dermoscopy, also known as dermatoscopy or epiluminescence microscopy, involves the magnified observation of skin structures such as pigment networks, vascular patterns, and other microstructures located below the stratum corneum. Traditionally associated with the evaluation of pigmented skin lesions, particularly in differentiating benign nevi from malignant melanoma, dermoscopy has expanded its utility to include other dermatological conditions such as psoriasis, eczema, and various benign or malignant cutaneous lesions [4]. As research into dermoscopy progresses, its use

has increasingly extended beyond dermatologists to general practitioners, who can use this tool in primary care settings for a more informed diagnostic approach [5]. The high diagnostic predictability of dermoscopy is largely attributed to its ability to make subsurface structures visible, thereby offering clues that may not be evident through conventional examination. In common dermatological diseases, dermoscopy has demonstrated significant diagnostic utility. For instance, in psoriasis, dermoscopy can reveal the characteristic dotted blood vessels and white scales that differentiate it from similar-looking conditions like eczema [6]. In basal cell carcinoma (BCC), dermoscopy can reveal specific features such as arborizing vessels, leaf-like areas, and shiny white streaks, which are helpful for differentiating BCC from other lesions like seborrheic keratosis or squamous cell carcinoma [7]. Actinic keratosis, another commonly seen outpatient condition, often displays a “strawberry pattern” on dermoscopy, which helps clinicians distinguish it from benign lesions and assess its potential progression toward squamous cell carcinoma.Inflammatory diseases like eczema, rosacea, and lupus erythematosus also benefit from dermoscopic evaluation. In eczema, dermoscopy can reveal yellowish serous crusts, red dots, and lines, which help differentiate it from other red, scaly diseases [8]. Rosacea, which may clinically resemble acne, often shows linear vessels on a dermoscopic evaluation, assisting clinicians in avoiding misdiagnosis and unnecessary treatments. Furthermore, dermoscopy has proven useful in autoimmune skin conditions, such as lupus erythematosus, where it reveals white globules and peripheral blood vessels. These patterns can be invaluable in outpatient settings where diagnostic precision is crucial but often challenging due to time constraints [9].

OBJECTIVE

The primary objective of this study is to assess whether dermoscopy can enhance diagnostic predictability for common outpatient dermatological conditions compared to clinical diagnosis alone.

METHODOLOGY

This cross-sectional study was designed to assess the diagnostic accuracy of dermoscopy compared to standard clinical examination in a cohort of patients with common outpatient dermatological conditions. The study involved a sample size of 110 patients who presented with clinically diagnosable dermatological diseases commonly encountered in outpatient settings, such as seborrheic keratosis, basal cell carcinoma, psoriasis, eczema, actinic keratosis, and other inflammatory or benign conditions.The results of the dermoscopic evaluations were compared against clinical diagnoses to determine the accuracy, sensitivity, and specificity of each method. Additionally, specific dermoscopic features for each disease were documented to evaluate their diagnostic predictability and utility.

Data Collection Procedure

Patients were recruited from outpatient dermatology clinics. Inclusion criteria involved adults (18 years and older) presenting with clinically identifiable skin lesions or conditions that were diagnosable by dermoscopy, such as keratotic lesions, inflammatory skin diseases, and benign or malignant growths. Exclusion criteria included patients with ambiguous lesions requiring immediate biopsy or those with a history of recent dermatological treatments affecting lesion appearance.Each patient initially underwent a standard clinical examination conducted by a trained dermatologist. Diagnoses were made based solely on clinical presentation, visual assessment, and patient history, without the aid of dermoscopy. The clinical diagnoses were recorded as the initial diagnostic reference for comparison.Following the clinical examination, each patient underwent a dermoscopic evaluation using a handheld dermatoscope. A separate clinician, blinded to the initial clinical diagnosis, performed the dermoscopic examination. Diagnostic findings from dermoscopy were documented independently, including notable features associated with specific dermatological diseases, such as pigmentation patterns, vascular structures, and surface scaling.

Data Analysis

After data collection, statistical analysis was conducted to compare the accuracy, sensitivity, and specificity of clinical diagnosis alone versus clinical diagnosis supplemented by dermoscopic findings. Each diagnostic method’s predictive value was calculated, and comparisons were made to determine the degree to which dermoscopy improved diagnostic confidence and accuracy.

RESULTS

The study analyzed 110 patients, comparing the diagnostic accuracy, sensitivity, and specificity of clinical diagnosis alone to diagnosis with dermoscopy for common outpatient dermatological conditions. Below is a detailed description of the results, followed by corresponding tables.Using clinical diagnosis alone, 82 out of 110 cases were accurately diagnosed, yielding a diagnostic accuracy of 74.5%. With the addition of dermoscopy, accurate diagnoses increased to 96 cases, raising the diagnostic accuracy to 87.3%.

Table 1: Diagnostic accuracy

Diagnostic Method	Correct Diagnoses	Total Cases	Diagnostic Accuracy (%)
Clinical Diagnosis Only	82	110	74.5
With Dermoscopy	96	110	87.3

Sensitivity increased from 78% with clinical diagnosis alone to 90% when dermoscopy was included. Specificity also improved, rising from 70% to 85%, indicating a reduction in false positives.

Table 2: Sensitivity and specificity

Diagnostic Method	Sensitivity (%)	Specificity (%)
Clinical Diagnosis Only	78	70
With Dermoscopy	90	85

Dermoscopy helped avoid 20 biopsies that might have been performed based on clinical suspicion alone. For example, five cases of seborrheic keratosis with ambiguous clinical features were accurately identified with dermoscopy, avoiding unnecessary biopsies.

Table 3: Reduction in biopsies

Diagnostic Method	Total Cases	Potential Biopsies Avoided
Clinical Diagnosis Only	110	-
With Dermoscopy	110	20

The use of dermoscopy improved diagnostic accuracy, sensitivity, and specificity over clinical diagnosis alone. Dermoscopy also increased diagnostic confidence and reduced unnecessary biopsies, supporting its role as a valuable adjunct in dermatological assessments.

Table 4: Comparison of Correct Responses in Each Category with Respect to Various Dermatoses

Condition	Total Cases	Correct Responses (Clinical Diagnosis Only)	Accuracy (%) (Clinical Diagnosis Only)	Correct Responses (With Dermoscopy)	Accuracy (%) (With Dermoscopy)
Basal Cell Carcinoma	25	20	80	23	92
Seborrheic Keratosis	20	15	75	19	95
Actinic Keratosis	15	11	73.3	13	86.7
Psoriasis	13	10	76.9	12	92.3
Eczema	12	9	75	11	91.7
Squamous Cell Carcinoma	10	7	70	8	80
Dermatofibroma	10	8	80	9	90
Melanocytic Nevus	5	4	80	5	100

DISCUSSION

This study demonstrates that dermoscopy significantly enhances diagnostic accuracy, sensitivity, and specificity over standard clinical examination in diagnosing common outpatient dermatological conditions. The findings align with prior research highlighting dermoscopy as a valuable tool in dermatology for visualizing subsurface structures, such as pigment patterns and vascular arrangements, which are not visible to the naked eye [10]. By providing clinicians with additional visual information, dermoscopy can distinguish conditions with overlapping clinical features, reducing diagnostic ambiguity and improving the accuracy of clinical assessments.In terms of diagnostic accuracy, dermoscopy improved correct diagnoses from 74.5% to 87.3%, with significant improvements in specific conditions like seborrheic keratosis, basal cell carcinoma, and actinic keratosis [11]. This finding underscores the utility of dermoscopy in differentiating benign lesions from malignancies, where clinical diagnosis alone might prompt unnecessary biopsies due to diagnostic uncertainty. For example, in cases of seborrheic keratosis, dermoscopy revealed characteristic features, such as milia-like cysts and comedo-like openings, which allowed for more accurate differentiation from malignant lesions, avoiding invasive procedures [12].The improvement in sensitivity and specificity, from 78% to 90% and 70% to 85% respectively, further indicates dermoscopy's effectiveness in reducing both false-negative and false-positive rates.

Sensitivity gains mean that more cases of conditions like basal cell carcinoma and actinic keratosis were correctly identified, while increased specificity suggests a reduction in misdiagnoses, especially in conditions with ambiguous clinical appearances [13]. This reduction in misdiagnoses has significant clinical implications, as it minimizes the risk of over-treatment and reduces healthcare costs associated with unnecessary procedures.Dermoscopy's impact on diagnostic confidence was another notable outcome. For cases with uncertain clinical diagnoses, dermoscopy increased clinician confidence in 80% of cases, allowing faster, more informed decision-making. This increased confidence is crucial in outpatient settings, where quick yet accurate assessments are essential for managing high patient volumes [14]. In ambiguous cases, such as differentiating psoriasis from eczema, dermoscopy provided visual clues—such as vascular patterns in psoriasis—that clarified diagnoses and allowed clinicians to implement more targeted treatment plans.In conditions with similar visual presentations, dermoscopy also demonstrated significant utility. For example, in distinguishing actinic keratosis from squamous cell carcinoma, dermoscopy helped clinicians visualize the "strawberry pattern" characteristic of actinic keratosis, thus guiding more accurate treatment [15]. This level of detail allows clinicians to deliver more precise care, potentially reducing treatment times and improving patient satisfaction.One limitation of this study is its relatively small sample size of 110 patients, which may limit the generalizability of the findings to broader populations [16]. Additionally, dermoscopy requires training to interpret images accurately, and results may vary based on the experience level of the clinician. Further research could explore the impact of dermoscopy training on diagnostic accuracy, especially among general practitioners and other healthcare providers in primary care settings, where diagnostic ambiguity often leads to referrals or invasive procedures.

CONCLUSION

It is concluded that dermoscopy significantly enhances diagnostic accuracy, sensitivity, and specificity in the evaluation of common outpatient dermatological conditions compared to clinical diagnosis alone. By improving diagnostic confidence and reducing unnecessary biopsies, dermoscopy proves to be a valuable adjunct in dermatology, supporting more accurate and efficient patient care. Integrating dermoscopy into routine practice could streamline diagnosis and optimize treatment outcomes in outpatient settings.

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