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EARLY MELANOMA DIAGNOSIS: A BIBLIOGRAPHIC REVIEW

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Abstract: This article seeks to cover aspects relating to the use of dermoscopy, as well as how it is used, the importance of this technique and its comparison with other means to aid in melanoma screening. 26 articles were used to prepare this study, in English, Portuguese and Spanish, using the Scielo, PubMed and Google Scholar databases. This technique has been fundamental for the early diagnosis of melanoma, through rapid screening, aiming to identify this comorbidity in its initial phase, so that, as a form of early diagnosis, the patient consequently presents the best prognosis.
Keywords: Early diagnosis; melanoma; prevention of diseases.

INTRODUCTION

Dermoscopy, also known as epiluminescence microscopy or incident light microscopy and skin surface microscopy, is a non-invasive in vivo technique widely used to examine skin lesions. Using a handheld instrument called a dermatoscope, this approach allows visualization of subcutaneous structures in the epidermis, dermal-epidermal junction, and papillary dermis, which are generally not visible to the naked eye. Dermoscopic images can be captured through photography or digital recording for storage or sequential monitoring of changes (Argenziano G, Soyer HP.2001;MARGHOOB, Ashfaq A. et al.,2003).

The application of dermoscopy in the evaluation of skin lesions, both in general dermatology and in primary care, has the main objective of helping the doctor in the decision to perform a skin biopsy, refer to a specialist, reassure the patient or monitor the lesion over time. Several studies, systematic reviews and meta-analyses highlight that dermoscopy increases diagnostic accuracy for skin cancer, including melanoma, compared to naked eye examination (Soyer HP, et al 2004; Luttrell MJ, et al 2011).

In the context of skin cancer screening, dermoscopy plays a crucial role in identifying lesions that require investigation for the possibility of malignancy. At this stage, the priority is to triage and classify patients and injuries to determine the need for treatment and the appropriate location for it (Wang., 2008; EDWARDS et al., 2020),

Dermoscopy, when deciding correctly on the management of the lesions (such as reassuring, performing a biopsy or referring), is fundamental, and it is less crucial to make a specific diagnosis in this context. Furthermore, several simplified algorithms have been proposed to guide the decision of which lesions should be biopsied in the skin cancer screening setting (EDWARDS et al., 2020).

Therefore, the aim of this study is to highlight the importance of this technique and explain how it is performed to identify possible malignant lesions in order to provide an early diagnosis and, consequently, a better prognosis for the patient.

METHODOLOGY

The present study is based on a literature review of the importance of dermoscopy in helping to diagnose melanoma. The literature search was conducted through a systematic search in the following databases: Scielo, Lilacs, PubMed and Google Scholar. Articles published in English, Spanish and Portuguese were considered.

The search terms used included the keywords: melanoma, screening, dermoscopy, early diagnosis, among other relevant words. The research covered a period of literature review that encompasses publications up to the year 2023.

The article selection strategy involved the exclusion of studies that did not meet the pre-established inclusion criteria. Duplicate articles and case reports were excluded, focusing on systematic reviews, meta-

analyses, review studies, clinical guidelines and relevant literature searches. In addition, studies published in peer-reviewed scientific journals were prioritized.

The literature review carried out in this study aims to provide relevant findings that the literature brings about the topic.

LITERATURE REVIEW

Dermoscopy can be performed using contact or non-contact mode, and with a polarized or non-polarized light source, resulting in three distinct techniques:

- Non-polarized contact dermoscopy (classic dermoscopy):

In this mode, direct contact between the endoscope lens and the skin surface is required. Unlike unpolarized light, which always requires a liquid interface (e.g., ultrasound gel, 70% ethanol), polarized light, although dispensable from the liquid interface, can benefit from it in polarized contact mode to provide an image clearer (Benvenuto-Andrade C, Dusza SW, Agero AL, et al, 2007)

- Polarized dermoscopy, contact:

Here, polarized light makes it possible to visualize the deeper layers of the skin. This enhances colors such as pink, red and white, as well as highlighting bright white and vascular structures. These characteristics are particularly relevant for identifying skin cancer, making polarized dermoscopy preferable for screening for this type of cancer (Wang SQ, Dusza SW, Scope A, et al. 2008)

- Polarized, non-contact dermoscopy:

This method also uses polarized light, but without the need for direct contact with the skin. The use of a liquid interface is not mandatory, but its inclusion can improve image sharpness, similar to the polarized contact mode (Agero AL, Taliercio S, Dusza SW, et al., 2006)

The preference for polarized dermoscopy, particularly in skin cancer screening scenarios, is due to its ability to provide clearer visualization of structures crucial for identifying dermatological conditions. These approaches, with their variations in contact and light sources, offer flexibility in choosing the most appropriate technique for different clinical situations (Wang et al., 2008).

COLORS AND STRUCTURES

The visualization of colors and structures in the epidermis and papillary dermis has generated new terminology for the morphological description of skin lesions. A histological correlation was established for most structures observed at dermoscopy.

COLORS

Colors seen in dermoscopy include yellow, red, brown, blue, gray, black, and white. Melanin is the most important chromophore in pigmented lesions, and the color of melanin on the skin surface depends on its concentration and location (Seidenari S, et al, 2005)

black:	Located in the stratum corneum.
brown:	In the epidermis and superficial dermis.
Grey/blue:	In the dermis.

In addition to these, the red color is determined by vascularization; a thrombus will appear black. White is associated with collagen/fibrosis, yellow is associated with keratin or sebum, and orange may be associated with serum crusting (Liebman et al., 2012).

VASCULAR STRUCTURES

In amelanotic and hypomelanotic lesions, the vascular structures (morphology, distribution and arrangement) may provide the only clues to the diagnosis. In pigmented lesions, pigmented structures provide the primary clue to diagnosis, and vascular morphology provides additional secondary clues to diagnosis (Jones et al., 2019; Balagula et al. 2012).

Non-contact polarized light is the preferred type of dermatoscope for viewing blood vessels. However, if a contact dermatoscope is used, ultrasound gel must be used as a liquid interface, as the gel acts as a cushion and reduces the need for pressure on the skin, avoiding blanching of the vessels (Liebman et al., 2012).

Dermoscopic evaluation of vascular structures includes morphology (e.g., stippled; linear, irregular, or serpentine; comma-like; corkscrew; loop-shaped or hooked; glomerular or coiled; arborized or branched), distribution (i.e., focal, diffuse, central, peripheral, or random), arrangement (e.g., crown, string of pearls, grouped, radial) and presence of white or pink halo (EDWARDS et al., 2020)

Although some vascular morphologies are more commonly associated with certain types of lesions (e.g., arborized vessels are common in basal cell carcinoma), the presence of a particular vascular morphology is not exclusive to a specific diagnosis. For example, punctate vessels can be seen in melanocytic tumors and also in squamous cell carcinoma, basal cell carcinoma, porokeratosis, clear cell acanthoma, and psoriasis (Balagula et al., 2012; Liebman et al., 2012).

Similarly, glomerular vessels are most commonly associated with squamous cell carcinoma/Bowen's disease, but can also be seen in clear cell acanthoma. Polymorphous vessels are typically associated with melanoma, but can also be seen in basal cell carcinoma. Arborized vessels are commonly seen in basal cell carcinoma, but can also be seen in melanoma and intradermal nevi. Hooked vessels are commonly associated with seborrheic keratoses, although they can also be seen in melanoma. Despite this overlap, the positive predictive value for a given vessel morphology can guide the clinician to the correct diagnosis if the clinical context is carefully considered (Jones et al., 2019; EDWARDS et al., 2020).

CLINICAL ROLE OF DERMOSCOPY

The relevance of dermoscopy in the in vivo diagnosis of melanoma is widely recognized. This occurs after the identification of an extensive set of dermoscopic characteristics present in benign and malignant lesions, accompanied by their histopathological correlates (Agero AL, et al. 2006; Benvenuto-Andrade C, et al. 2007)

Cross-sectional studies, randomized trials, meta-analyses and a 2018 Cochrane systematic review indicate that dermoscopic examination has greater discriminatory capacity compared to naked eye examination, especially in the detection of skin cancer, including melanoma, in experimental or clinical settings. of daily practice (Jaimes N, et al, 2015; Luttrell MJ, et al 2011)

For physicians with at least minimal training in dermoscopy, incorporating this procedure into the clinical examination increases the accuracy of in vivo diagnosis of skin cancer and reduces the need for unnecessary biopsies. In fact, 86% of dermoscopy users in 32 European countries reported an increase in melanoma detection, while 70% observed a reduction in the number of unnecessary biopsies of benign lesions (BRAUN, R. P. et al. 2007)

Regarding diagnostic accuracy for melanoma, three meta-analyses and a 2018

Cochrane systematic review highlight the improvement provided by dermoscopy compared to naked eye examination (ARGENZIANO, et al 2003).

In one of these meta-analyses, involving nine studies in clinical settings, an odds ratio for the diagnosis of melanoma of 9 (95% CI 1.5-54.6) was reported for dermoscopy associated with clinical examination, compared to clinical examination isolated. Summary sensitivity was 90% (95% CI 80-95), and specificity was 90% (95% CI 57-98) for dermoscopy plus clinical examination. The sensitivity was 71% (95% CI 59-82), and the specificity was 81% (95% CI 48-95) only for the clinical examination. Notably, sensitivity increased without a reduction in specificity, indicating that the increased melanoma detection rate did not result in a simultaneous increase in the number of unnecessary excisions of benign lesions (PROCIANOY, et al. 2009).

Several factors can influence the diagnostic performance of dermoscopy:

- Examiner's experience
- Diagnostic algorithm and threshold for a positive test
- Prevalence of melanoma in the patient population examined
- Clinical context and patient-related factors

A systematic review of 27 studies carried out in clinical and experimental settings revealed that the diagnostic accuracy of dermoscopy was lower for inexperienced examiners compared to experts, being inversely proportional to the prevalence of melanoma in the sample. Experience has been shown to improve the diagnostic accuracy of complex algorithms such as pattern analysis, while not affecting the performance of simpler algorithms such as the ABCD rule (asymmetry, sharpness of edges, colors and dermoscopic structures) of dermoscopy (EDWARDS, et al 2020).

Two clinical trials conducted in primary care settings indicated that brief training in dermoscopy enables non-dermatologists to utilize simplified diagnostic algorithms, improving their accuracy in diagnosing melanoma (Vestergaard ME, 2008)

In the first study, 73 primary care doctors received a one-day training in skin cancer detection and dermoscopy. They were subsequently randomly assigned to use a portable polarized light dermatoscope or perform the naked-eye examination to evaluate pigmented lesions on their patients for 16 months. All patients were independently evaluated by specialized dermatologists. The sensitivity for referral of suspicious lesions was significantly higher in the dermoscopy group (79%) compared to the naked eye examination group (54%), with no difference in specificity (71% and 72%, respectively)(Argenziano G, et al 2006).

In the second research, a 2019 systematic review involving 23 randomized, observational studies in primary care settings confirmed that dermoscopy, when combined with appropriate training, was associated with improved diagnostic accuracy for melanoma and benign lesions, reducing unnecessary excisions and referrals (Jones OT, et al 2019;)

- A scoping review in 2021 also highlighted that dermoscopy training in primary care settings often results in improved diagnostic ability (Fee JA, et al 2020) However, primary care physicians who participate in short dermoscopy training may not maintain their practice long term. Furthermore, the minimum amount of training required to achieve competency in dermoscopy has not yet been established (Fee JA, et al 2020; Seidenari S, et al 2006).Indications: Dermoscopy is valuable in the evaluation of pigmented and non-pigmented skin

lesions, helping to decide whether or not to perform a biopsy to rule out skin cancer. This exam is particularly useful for patients with multiple common and/or atypical nevi, who are at increased risk of melanoma. In such cases, dermoscopy of nevi helps in identifying suspicious lesions that may not be evident to the naked eye (Seidenari S, et al 2006).

Although it is beneficial to examine as many lesions as possible in patients with multiple nevi, special attention should be paid to:

- Any new or changing lesions.
- Any injuries that are a concern (including symptomatically) to the patient.

The recognition of dermoscopy as a crucial tool in the in vivo diagnosis of melanoma is widely accepted, highlighting its usefulness in clinical practice after identifying dermoscopic features in benign and malignant lesions (Bowling, et al, 2007).

Effectively practicing dermoscopy requires formal training, with online resources and tutorials available to help. Studies indicate that, compared to naked eye examination, dermoscopy has greater discriminatory power in detecting skin cancer, including melanoma, resulting in more accurate diagnoses and a reduction in unnecessary biopsies (EDWARDS et al., 2020; Balagula et al., 2012).

Several factors, such as examiner experience, diagnostic algorithm, prevalence of melanoma in the population, and clinical context, influence dermoscopy performance. Brief dermoscopy training for primary care physicians has demonstrated improvements in diagnostic accuracy, increasing sensitivity for referral of suspicious lesions (Jones et al., 2019; EDWARDS et al., 2020).

Dermoscopy is especially useful in the evaluation of pigmented and non-pigmented skin lesions, being a valuable tool for patients with multiple nevi, helping to identify suspicious lesions not visible to the naked eye. Special attention is recommended for new, changing, clinically suspicious or discrepant lesions (Kittler H, et al, 2002).

In addition to the diagnosis of melanoma, dermoscopy stands out in the evaluation of various dermatological entities, such as inflammatory and infectious diseases, hair and nail disorders (Balagula et al., 2012).

PURPOSES AND BENEFITS

In general dermatology, dermoscopy is used to decide whether biopsy or referral is needed, with specific algorithms developed for this purpose.
In specialized environments, dermoscopy aims to differentiate early melanoma from benign lesions, being useful in monitoring high-risk patients.
Benefits include increased sensitivity for melanoma diagnosis, reduction of unnecessary biopsies and digital surveillance of melanocytic lesions

Fonte: Carli P, et al 2004

2. LIMITATIONS

Diagnostic accuracy depends on the experience of the observer and may be inferior to naked eye examination in inexperienced hands.
Atypical melanomas may escape dermoscopic detection.
Digital dermoscopic images, although useful for remote consultations, may present some loss of precision.

H, et al,2002; Binder M, et al 1995).

CONCLUSION

Dermoscopy plays a crucial role in the accurate diagnosis of melanoma, improving sensitivity and confidence in diagnosing skin lesions. Specific algorithms and adequate training are essential to optimize their use, providing significant benefits in clinical practice. Therefore, greater implementation and updates regarding this technique are necessary to improve both early diagnosis and the patient's prognosis, providing them with a better quality of life over time.

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