

Effect of a Dermoscopy Training Course on the Accuracy of Primary Care Physicians in Diagnosing Pigmented Lesions

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It is important that primary care physicians (PCP) are able to differentiate between benign and malignant skin lesions and know when excision or referral to a specialist is required. It has been shown that PCP who decide to treat a skin lesion themselves submit only 60% of all excised skin lesions for histopathology (1, 2). Furthermore, some studies (3–5) found a 30% discrepancy between clinical diagnosis by PCP and histopathological examination. The sensitivity of correct diagnosis of melanoma among PCP was in the range 17–60% (5, 6); thus there is a room for improvement.

The diagnostic accuracy of pigmented skin lesions (PSL) increases significantly when dermoscopy is used alongside clinical examination (7). However, diagnostic accuracy drops when dermoscopy is used without adequate training (8, 9). A few studies have investigated the effects of a dermoscopy training course for PCP (10, 11).

The aim of the current study was to evaluate the effect of a dermoscopy training course on the ability of PCP in identifying pigmented skin lesions and choosing the correct therapeutic strategy.

METHODS

The educational intervention consisted of an intensive 1-day course and an e-learning module on clinical and dermoscopic features, diagnosis and management of PSL. The course material included the books “Dermoscopy, MEMO” (12) and “Dermoscopy: an Atlas” (13) (optional) and PDF files of the given presentations.

Prior to the educational intervention all participants were required to take a pre-test of clinical images and, within 3 months of completion of the course, an identical post-test and an integrated post-test (clinical and dermoscopy images). The tests included 20 cases (3 melanoma, 2 basal cell carcinoma (BCC), 12 melanocytic naevi, 1 angioma, and 2 seborrhoeic keratosis (SK)). For each case PCP were asked to answer questions about the diagnosis of the lesion and the therapeutic strategy. Diagnosis of the presented lesions was either confirmed by histopathology, for the malignant lesions and naevi, or by their typical clinical and dermoscopic appearance for the angioma and SK by an expert dermatologist. Each case was presented as a clinical overview image complemented with a detailed picture. Additional information, concerning sex, age, family history and history of the lesions (e.g. change, itching) was provided. For the integrated post-test clinical and dermoscopic pictures were provided. Dermoscopy pictures were taken with a Heine Delta 20 dermatoscope (Hersching, Germany) attached to a Canon Powershot S90 camera.

A total of 309 participants completed a questionnaire on demographics and questions related to PSL and their experience with dermoscopy. Of these, 293 participants (consisting of PCP, PCP for the elderly and primary care physicians in training) completed the pre-test, post-test and integrated post-test.

All data analyses were performed with R:A language and environment for statistical computing, reference index version 2.15.1. To assess the diagnostic accuracy and the decision for the correct therapeutic strategy of PSL, sensitivity and specificity were calculated. To compare sensitivity before and after the intervention statistical analysis was performed using McNemar’s χ^2 tests. Significance was determined at $\alpha=0.05$.

RESULTS

A total of 309 participants completed the questionnaire of whom 293 participants completed the pre-test, post-test and integrated post-test. Due to confidentiality participants’ questionnaire results were not linked to their test scores. Therefore, descriptive statistics were performed on the entire dataset of 309 participants. Mean age was 45.2 years (range 28–63 years; 48.2% males and 51.8% female). Thirty-four percent of participants indicated that they examined at least 3 PSL per week; 37% of participants indicated regularly using dermoscopy when examining PSL. However, only 16% indicated to have had any prior training in dermoscopy. Twenty-five percent of participants had not discovered a single melanoma in the last 3 years, 33% had discovered one melanoma in the last 3 years, and only 40% had discovered more than 2 melanomas in the last 3 years. Sixty-nine percent of the participants do not perform total body examination in patients presenting with a PSL and 81% of the participants excise benign PSL themselves, while suspicious PSL are excised by 43% and only 1% excises clear cut melanomas. Only 25% of the participants indicated to be familiar with the Dutch melanoma guideline.

Diagnostic accuracy

The diagnostic accuracy of all PSL, except naevi, increased after the educational intervention when comparing the pre-test and post-test (Table S1¹). The sensitivity of diagnosis of PCP for BCC and SK increased significantly; 22.01% ($p<0.001$) and 13.65% ($p<0.001$), respectively. When comparing post-test with integrated post-test scores (Table S1¹) sensitivity increased even further for almost all pigmented lesions ($p<0.001$ for all), except for naevi, which decreased by 21.53% ($p<0.001$). The sensitivity for SK and angioma increased significantly: 43.51% ($p<0.001$) and 37.54% ($p<0.001$),

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respectively. Specificity increased significantly between pre-test and post-test scores for angioma ($p < 0.001$) and BCC ($p < 0.001$). Comparing the specificity of post-test scores with integrated post-test scores revealed a significant increase for BCC and naevi, and a significant decrease for melanoma and SK ($p < 0.001$). There was no change for angioma.

Therapeutic strategy

Table SI¹ shows the difference in the percentage of correctly chosen therapeutic strategy between the pre-test, post-test and integrated post-test. A small, but significant, increase was found for naevus cases in pre-test vs. post-test scores ($p = 0.003$). There was a significant increase between post-test and integrated post-test for all malignant, SK and angioma cases ($p < 0.001$) and a small, but significant, decrease for naevi ($p = 0.003$). The greatest difference in percentage of the correct chosen therapeutic strategy was seen for SK and angioma, which showed a difference of 21.5% ($p < 0.001$) between the post-test and integrated post-test.

DISCUSSION

We found that the diagnostic accuracy of all PSL improved significantly after the training programme, especially for non-melanocytic lesions. After the addition of dermoscopy the diagnostic accuracy increased even further, except for naevi. A recent overview article (14) showed similar results. A study by Argenziano et al. (11) also demonstrated a significantly higher sensitivity for detecting BCCs and squamous cell carcinomas when dermoscopy was added to the clinical skin examination (79.2% vs. 54.1%, $p = 0.002$). There was no difference for melanomas. Two other studies (10, 15) found a significant increase in the sensitivity of the diagnosis of melanoma by clinical skin examination alone and clinical skin examination complemented with dermoscopy. This improvement may be higher than expected, due to the fact that half of all lesions were melanoma. In a study by Menzies et al. (16) no difference in sensitivity or specificity of diagnosing melanoma was found after the use of dermoscopy. However, after using dermoscopy they found a decrease of 63% in the number of excisions and referrals of benign lesions. Koelink (17) showed that the probability of correct diagnosis of PSL by PCP was 1.25 times greater after the addition of dermoscopy. Our study showed a significant increase in the percentage of correctly chosen therapeutic strategy. This result was found mainly for the benign lesions, which corresponds to a decrease in the number of (unnecessary) excisions and referrals. From this limited number of studies, we can conclude that the number of unnecessary excisions and referrals, especially of non-melanocytic lesions, decreases when dermoscopy is added to the naked eye examination.

This study has several limitations. Although patients' history and clinical images were given, the evaluation of nevi after dermoscopy got worse, which could mean that the clinical information might have been insufficient. Despite the high number of participants the restricted number of cases remains a limitation. In addition, the evaluations were carried out under study conditions rather than in real practice.

Our data support that PCP should undergo formal training in dermoscopy in order to become more confident in the recognition of PSL. It does improve their ability to diagnose non-melanocytic PSL, resulting in a decrease in (unnecessary) excisions and referrals.

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