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Reflectance confocal microscopy for diagnosing keratinocyte skin cancers in adults.

Dinnes J, Deeks JJ, Chuchu N, Saleh D, Bayliss SE, Takwoingi Y, Davenport C, Patel L, Matin RN, O'Sullivan C, Patalay R, Williams HC; Cochrane Skin Cancer Diagnostic Test Accuracy Group. Cochrane Database Syst Rev. 2018 Dec 4;12:CD013191. doi: 10.1002/14651858.CD013191.

ABSTRACT

BACKGROUND:Early accurate detection of all skin cancer types is important to guide appropriate management and improve morbidity and survival. Basal cell carcinoma (BCC) is usually a localised skin cancer but with potential to infiltrate and damage surrounding tissue, whereas cutaneous squamous cell carcinoma (cSCC) and melanoma are higher risk skin cancers with the potential to metastasise and ultimately lead to death. When used in conjunction with clinical or dermoscopic suspicion of malignancy, or both, reflectance confocal microscopy (RCM) may help to identify cancers eligible for non-surgical treatment without the need for a diagnostic biopsy, particularly in people with suspected BCC. Any potential benefit must be balanced against the risk of any misdiagnoses. OBJECTIVES:To determine the diagnostic accuracy of RCM for the detection of BCC, cSCC, or any skin cancer in adults with any suspicious lesion and lesions that are difficult to diagnose (equivocal); and to compare its accuracy with that of usual practice (visual inspection or dermoscopy, or both). SEARCH METHODS:We undertook a comprehensive search of the following databases from inception to August 2016: Cochrane Central Register of Controlled Trials; MEDLINE; Embase; CINAHL; CPCI; Zetoc; Science Citation Index; US National Institutes of Health Ongoing Trials Register; NIHR Clinical Research Network Portfolio Database; and the World Health Organization International Clinical Trials Registry Platform. We studied reference lists and published systematic review articles. SELECTION CRITERIA:Studies of any design that evaluated the accuracy of RCM alone, or RCM in comparison to visual inspection or dermoscopy, or both, in adults with lesions suspicious for skin cancer compared with a reference standard of either histological confirmation or clinical follow-up, or both. DATA COLLECTION AND ANALYSIS:Two review authors independently extracted data using a standardised data extraction and quality assessment form (based on QUADAS-2). We contacted authors of included studies where information related to the target condition or diagnostic threshold were missing. We estimated summary sensitivities and specificities using the bivariate hierarchical model. For computation of likely numbers of true-positive, false-positive, false-negative, and true-negative findings in the 'Summary of findings' tables, we applied summary sensitivity and specificity estimates to lower quartile, median and upper quartiles of the prevalence observed in the study groups. We also investigated the impact of observer experience. MAIN RESULTS:The review included 10 studies reporting on 11 study cohorts. All 11 cohorts reported data for the detection of BCC, including 2037 lesions (464 with BCC); and four cohorts reported data for the detection of cSCC, including 834 lesions (71 with cSCC). Only one study also reported data for the detection of BCC or cSCC using dermoscopy, limiting comparisons between RCM and dermoscopy. Studies were at high or unclear risk of bias across almost all methodological quality domains, and were of high or unclear concern regarding applicability of the evidence. Selective participant recruitment, unclear blinding of the reference test, and exclusions due to image quality or technical difficulties were observed. It was unclear whether studies were representative of populations eligible for testing with RCM, and test interpretation was often undertaken using images, remotely from the participant and the interpreter blinded to clinical information that would normally be available in practice.Meta-analysis found RCM to be more sensitive but less specific for the detection of BCC in studies of participants with

equivocal lesions (sensitivity 94%, 95% confidence interval (CI) 79% to 98%; specificity 85%, 95% CI 72% to 92%; 3 studies) compared to studies that included any suspicious lesion (sensitivity 76%, 95% CI 45% to 92%; specificity 95%, 95% CI 66% to 99%; 4 studies), although CIs were wide. At the median prevalence of disease of 12.5% observed in studies including any suspicious lesion, applying these results to a hypothetical population of 1000 lesions results in 30 BCCs missed with 44 false-positive results (lesions misdiagnosed as BCCs). At the median prevalence of disease of 15% observed in studies of equivocal lesions, nine BCCs would be missed with 128 false-positive results in a population of 1000 lesions. Across both sets of studies, up to 15% of these false-positive lesions were observed to be melanomas mistaken for BCCs. There was some suggestion of higher sensitivities in studies with more experienced observers. Summary sensitivity and specificity could not be estimated for the detection of cSCC due to paucity of data. AUTHORS' CONCLUSIONS:There is insufficient evidence for the use of RCM for the diagnosis of BCC or cSCC in either population group. A possible role for RCM in clinical practice is as a tool to avoid diagnostic biopsies in lesions with a relatively high clinical suspicion of BCC. The potential for, and consequences of, misclassification of other skin cancers such as melanoma as BCCs requires further research. Importantly, data are lacking that compare RCM to standard clinical practice (with or without dermoscopy). PMID: 30521687 DOI: 10.1002/14651858.CD013191