

Development of a system for the scanning of the diabetic foot in the home-environment: a validity and reproducibility study

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Early recognition of diabetic foot problems is considered an important component of diabetic foot care in patients who have neuropathy and are at high risk for ulceration in order to prevent further complications. The Vincent50 is a foot scanner developed for this purpose. It provides photographs of the plantar surface of the foot in the home-environment of high-risk patients, which are remotely assessed by trained professionals

on (pre-) signs of ulceration. The aim of this study was to assess the validity and reproducibility of using the Vincent50 foot scanner for the diagnosis of foot problems in diabetic patients. After a pilot study on validity and reproducibility of a total of 73 diabetic patients¹, we performed a second study with improved settings (calibration of the photo camera) of the device. We here present our new results of 32 patients. Again, patients with a variety of plantar foot problems or without any foot problems, had both feet photographed using the Vincent50 foot scanner, followed immediately by a live assessment (reference condition). Photographic assessments were done two and four weeks post scanning. All assessments were done by four different observers, two surgeons and two wound consultants. Each foot was assessed for the presence of an ulcer, or abundant callus requiring referral for treatment. Scores on photographic assessments (per sign and foot region) were compared with the live assessments to determine agreement for validity purposes and between occasions to determine agreement for reproducibility purposes. In a total of 60 feet, ulceration was cumulatively scored 59 times, callus 78 times and no signs 149 times during live assessment. The agreement, expressed in kappa, between live and photographic assessment was 0.90 for ulcer (range between observers 0.84 - 1), 0.61 for callus (0.57 - 0.72) and 0.84 (0.64 - 0.97) for scoring no signs. The agreement between the two photographic assessments was 0.97 (0.91 - 1), 0.87 (0.91 - 1 and 0.95 (0.89 - 1) for each of these three signs, respectively. Photographic assessments showed strong agreement with live assessment for ulcer and no foot problems and moderate to good agreement for callus. Reproducibility of photographic assessment was good for all signs. The inter-observer variation was small. These data suggest that the Vincent 50 foot scanner can be a useful tool for assessing important clinical signs of diabetic foot problems.

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