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Accuracy of Daily Foot Temperature Monitoring for Patients with Recently Healed Diabetic Foot Ulcers or History of Amputation

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Abstract:

Diabetic foot ulcers (DFU) result in significant morbidity, mortality, and healthcare costs. Fortunately, recent data suggest as many as 75% of DFU and 60% of lower extremity amputations (LEA) may be preventable. Clinical practice guidelines recommend evidence-based foot temperature monitoring (thermometry) for preventing DFU and its complications in high-risk patients. Despite this, several authors have noted that thermometry is not commonly practiced. This is potentially due to lack of evidence on the accuracy of thermometry in some of the highest-risk cohorts, including those with a recently-healed DFU or with history of LEA. The former may present with ipsilateral inflammation as part of normal healing, while the latter may lack the anatomy required for direct contralateral comparison of temperatures. Whether these concerns affect the accuracy of thermometry needs to be assessed. A recent study suggests that a novel thermometric mat may address some barriers to adoption. The mat was found to predict as many as 97% of non-traumatic plantar DFU with an average lead time of five weeks in a cohort with history of DFU. In the current investigation, we hypothesized no difference in the predictive accuracy of thermometry in two subgroups: those who healed from a DFU fewer than three months before enrolling, and those with a history of partial LEA (Syme amputation or more distal). Of the 129 subjects studied, 31% had recently-healed DFU and 56% had history of LEA. Although no difference in DFU incidence was found in the LEA subgroup, we found significantly higher incidence in those with recently-healed DFU (0.88 vs 0.63 DFU/subject/year). Importantly, we found no differences in accuracy or lead time in either cohort. These data suggest thermometry is appropriate for monitoring both recently-healed DFU or partial LEA patients. Utilization of thermometry in these high-risk patients may significantly reduce morbidity, mortality, and resource utilization.

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