

The utility of E-med scan and foot mate print technologies in diabetic neuropathy ascertainment, Dar es Salaam, Tanzania.

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Background: In Africa, diabetic foot ulceration is often associated with peripheral neuropathy (PN) and substantial morbidity and mortality. Thus, new affordable technologies for PN screening have the potential to improve patient out **Objectives:** We carried out this study to (i) evaluate two technologies—the foot E-med scan system (EMS) and the simple Foot Mate print (FMP)—in plantar pressure measurement; and (ii) correlate these measurements with PN ascertained clinically. **Methods:** During Jan 2011 - Nov 2013 (study period), all patients attending a diabetes centre in Dar es Salaam, Tanzania, were evaluated clinically following informed consent. Pressure at various sites on each foot was measured with EMS technology and FMP with an ink pad (dark areas reflected high pressures.) PN was ascertained at standard anatomic sites with a thermal sensation machine for pain (warm, heat, cold), monofilament for protective sensation, and biothesiometer for vibration. **Results:** Of 1407 patients enrolled during the study period, 801 (60%) were male and 747 (53%) had PN by clinical assessment. Median age =52 (range: 11-90) years; median body mass index=29 (range: 14-59) kg/m²). Patients with PN were significantly more likely than those without PN to be older (54 vs. 50 years, p <0.01) or to have a longer duration of diabetes (6 vs. 4 years, p <0.001). In addition, per EMS technology, patients with PN were more likely to have significantly higher plantar pressures at the big toe (p <0.0001), 3rd, 4th, and 5th toes (p <0.0001), central hind foot (p <0.05), and mid hind foot (p=0.005) versus patients without PN. In contrast, FMP recorded high plantar pressures for PN patients only at the 2nd (p <0.05) and 3rd (p=0.008) toes. **Conclusion:** pressure measurements were largely predictive of PN. While EMS was more sensitive than FMP in detecting high plantar pressures in patients with underlying PN confirmed by thermal sensation, biothesiometry, and monofilament testing across various anatomic areas of the foot, FMP was sensitive in predicting problems mainly in the toes rather than the hind foot. Despite these differences, both technologies have major roles to play in the management of diabetic foot complications in Africa and other countries with limited resources.