

PRIZE P3

Association between peak pressure and pressure time integral in footwear studies on the diabetic foot: What is the need to report both variables?

Roelof Waaijman, Sicco A. Bus

¹Academic Medical Centre, Dept of Rehabilitation, Amsterdam, the Netherlands

Background and aims: Both peak pressure (PP) and pressure time integral (PTI) are often reported as study parameter in diabetic foot studies, since elevated levels in both variables have been associated with plantar ulceration. In the majority of these studies minimal differences are reported between PP and PTI results, leading to similar conclusions (Bus et al. 2008). For this reason, the additional value of reporting PTI next to PP may be small. To further investigate this, the aim of this study was to explore the association between PP and PTI in diabetic patients wearing different types of special footwear. **Patients and methods:** In a total of 69 neuropathic diabetic patients in-shoe plantar pressure was measured using Novel Pedar-X. Five footwear conditions were analyzed: custom made orthopedic footwear, forefoot offloading shoe (FOS), vacuum cast replacement system (VCRS), Mabal cast shoe, and a control shoe. Pearson correlations coefficients between PP and PTI were calculated for each of 6 foot regions. **Results:** For all regions and footwear conditions significant correlations were found between PP and PTI, except for the heel in the VCRS (Table 1). Highest correlations were found in the forefoot, lowest in the heel. Detailed analysis of the PP and PTI association in the heel and hallux regions in one of the footwear conditions (VCRS) showed a significantly longer contact time (630 vs 338 ms) and more variability in the peak pressure-time curve in the heel, compared to the hallux. **Discussion and conclusion:** The lower correlations measured in the heel may be explained by the possibility that longer contact times can contribute to a greater variability in PTI than in PP. However, most diabetic foot studies focus on the forefoot region since these are more at risk for ulceration. Therefore, the results seem to suggest that there is no need to report on both PTI and PP in the same diabetic footwear study. Further research is necessary to confirm this suggestion.

1) Bus S.A, Waaijman R. *The additional value of reporting pressure-time integral results in foot pressure studies on the diabetic foot, ESM meeting, Dundee, Scotland, 2008*

Table 1. Correlation values between PP and PTI (* Significant correlation at P<0.05).

	N	Heel	Midfoot	Metatarsal 1	Metatarsal 2-5	Hallux	Toes 2-5
Pulman	39	,60*	,87*	,76*	,86*	,82*	,95*
FOS	37	,58*	,77*	,64*	,85*	,80*	,77*
Orthopedic shoes	30	,42*	,80*	,85*	,92*	,86*	,82*
Mabal cast shoe	24	,53*	,93*	,90*	,90*	,90*	,88*