RELIABILITY OF MODIFIED ADHEREMETER AND DIGITAL PRESSURE ALGOMETER IN MEASURING NORMAL ABDOMINAL TISSUE AND C-SECTION SCARS

Rachel Kelly-Martin, DPT*
Laura Doughty, DPT
Marina Garkavi, DPT
Franklin Pierce University
Manchester, NH

Jennifer B. Wasserman, DPT, MS, PhD
Rocky Mountain University of Health Professions
Provo, UT

and

Franklin Pierce University,
Manchester, NH
ABSTRACT

Objective
This study tested inter- and intrarater reliability of the digital pressure algometer and modified adheremeter and concurrent validity in the algometer in both normal abdominal tissue and in chronically painful C-section scars.

Study Design
Correlational Reliability/Validity

Background
The algometer is used to measure pressure-pain threshold (PPT). The adheremeter is a tool to measure tissue extensibility. Painful abdominal scars are being treated successfully with soft-tissue techniques yet reliable measurement tools for this tissue have not been reported.

Methods and Measures
59 subjects with normal abdominal tissue were marked at a point 2 inches inferolateral to the umbilicus. Two separate testers measured PPT twice with an algometer and tissue extensibility in superior/left/inferior/right directions with a modified adheremeter. 29 subjects with painful C-section scars were marked at 2.5 cm intervals along the scar. A total of 115 points were measured in the same manner as above. C-section subjects also were asked to rate their pain using the numeric pain rating scale (NPRS). Each tester was blinded to all other measurements.

Results
For PPT, intraclass correlations (ICC’s) ranged from 0.814 to 0.933 with a standard error of measurement (SEM) ranging from 1.65N to 5.9 N. For tissue mobility, ICC’s ranged from 0.430 to 0.914; SEM ranging from 1.67mm to 3.7mm. All but 2 measures had ICCs
that were good-excellent. Inferior glide in C-section tissues showed the least and multi-directional measurement the strongest reliability. The PPT had a moderate negative correlation ($r = -0.551$) with the NPRS.

Conclusions

The algometer showed excellent inter- and intra-rater reliability on normal abdominal tissue and C-section scars. It showed moderate criterion validity when compared against the NPRS. The modified adheremeter showed good-excellent inter- and intra-rater reliability on both normal abdominal tissue and C-section scars. Both measures have clinical and research applications for women’s health practitioners.

Key Words

Measurement, Scar Pain, Tissue Mobility