Pelvic and Acetabulum Fractures – Which Functional Outcome Measure Should We Use? An Analysis of Responsiveness Over the First Year of Recovery

***Sebastian** Ko, **MD**; Kelly A. Lefaivre, MD[1]; Peter J. O'Brien, MD[1]; Pierre Guy, MD; Abdullah Mamun; Henry Broekhuyse, MD*
[1]University of British Columbia, Vancouver, British Columbia, CANADA

Purpose: Pelvic and acetabulum fractures are complex injuries. The best clinical outcome tools to use in research related to these injuries remain largely unstudied. A recent systematic review found a lack of validity and responsiveness testing with pelvic-specific instruments. For generic health scores, the Short Form-36 (SF-36) and Short Musculoskeletal Function Assessment (SMFA) have been used in pelvic and acetabular fracture research, but no comparison of the responsiveness of the 2 in this population has been done. The purpose of this study is to compare the responsiveness of SF-36 PCS to SMFA DI in pelvic/acetabular fracture patients over the first year of recovery.

Methods: 465 patients with pelvic or acetabulum fractures were recruited at a Level I trauma center between 2005 and 2015. SF-36 PCS and SMFA DI were collected prospectively at baseline, 6 months, and 12 months. Responsiveness was evaluated with the standard response mean (SRM), proportion of patients that achieved MCID, and ceiling and floor effects. Paired t tests were used to compare SRMs, and McNemar's test was used to compare the proportion of patients experiencing MCID in SF-36 versus SMFA. Statistical significance was set at a $P < 0.01$.

Results: The mean ISS was 14.3. Mean age was 44.2 years. SF-36 PCS and SMFA DI showed strong correlation for all time intervals. The SRM of SF-36 PCS was significantly greater than the SRM of SMFA DI between baseline and 6 months ($P < 0.0001$) and nearly so between 6 and 12 months ($P = 0.06$). The proportion of patients achieving MCID in SF-36 PCS was greater than in SMFA DI between baseline and 6 months (82.24% vs 69.74%, $P < 0.0001$). Between 6 and 12 months, more patients met MCID with SF-36 PCS (60.53% vs 55.59%), but did not reach significance. There were no ceiling or floor effects found for SF-36 PCS at any time point. The SMFA was found to have a floor effect at baseline (17.82%), and consistently had higher floor estimates at each time point than the SF-36 PCS, but not greater than 10%.

Conclusion: This study demonstrates that the SF-36 PCS is a more responsive measure of functional outcome than the SFMA DI in patients with pelvic and acetabulum fractures, despite the theoretical advantage of a musculoskeletal-specific measure. This superiority was found in using the SRM, proportion of patients meeting MCID, and floor effects. These findings support the isolated use of the SF-36 PCS as the best general functional outcome measure in patients with pelvic and acetabulum fractures, while limiting the burden for both the patient and clinician.