D2.S3.1(5). Static posture and competition level do not predict dynamic pelvic posture in equestrian riders

CELESTE WILKINS*, KATHRYN NANKERVIS, LAURENCE PROTHEROE & STEPHEN DRAPER

Hartpury University
*Corresponding author: celeste.wilkins@hartpury.ac.uk
@misscwilkins

Static assessment is common practice in equestrian performance analysis and research (Hobbs et al., 2014, *Journal of Human Kinetics, 42*, 113–125)and competition level is often used as an indication of rider expertise (Eckardt, Münz, & Witte, 2014, *Journal of Equine Veterinary Science, 34*, 1294–1299). Since the rider's lumbopelvic region acts as the interface between horse and rider movement, the aim of this study was to assess the accuracy of static assessment in the prediction of dynamic technique and association between competition level and pelvic tilt. With institutional ethics approval, 35 competing dressage riders (mean ± SD age: 29.51 ± 1.76, body mass: 62.00kg ± 3.23) were assigned to novice ($n = 11$), intermediate ($n = 15$) or advanced ($n = 9$) groups based on their competition results in the last 6 months. Riders were assessed on a riding simulator (Eventing Simulator, Racewood, Cheshire, UK) using motion capture (Miqus M3, Qualisys, Gothenburg, Sweden) in halt for 2 seconds and for 2 repetitions of 10 seconds of walk, trot, and left/right canter. Gait order was standardised but starting canter lead was randomised and alternated on each repetition. Markers placed on the rider's left/right anterior superior iliac spine, left/right posterior superior iliac spine and body of the sacrum were incorporated into a rigid body representing the pelvis. Pitch rotations were extracted and filtered (moving average with 10 frames in the filter window). Mean pitch values (± SD) were compared between gait and competition level groups to find significant correlations and effect of skill or gait. Measures of pelvic tilt in halt were not significantly ($p < 0.05$) correlated to any dynamic posture (walk: $r = 0.253$, trot: $r = 0.066$, left canter: $r = -0.042$, right canter: $r = 0.131$) or competition level ($r = -0.330$). Dynamic pelvic tilt was significantly ($p < 0.05$) correlated between all gaits. All riders displayed significantly greater posterior pelvic tilt in trot ($p = 0.039$), left canter ($p = 0.015$) and right canter ($p = 0.001$) than in walk. The results indicate that competitive riders follow similar patterns of pelvic technique that are related to the horse's gait and independent of their static posture. Further research should focus on individual functional and anatomical factors relating to pelvic posture.