Kinematic and saddle pressure analysis of elite side-saddle riders versus novice level side-saddle riders

H. Tredup and V. Lewis*

Hartpury University, Gloucestershire, UK

INTRODUCTION: Current research has identified significant differences in rider ability across different levels. As rider ability has been known to have a distinct effect on equine performance, it is important to identify the optimal riding style to enable the optimal rider-horse combination. To date there have been no studies assessing side-saddle rider ability. A comparison of novice and advanced side-saddle riders offers an insight into the potential differences and variations in riding style.

AIM: The purpose of this study was to identify whether there were any significant differences in the riding position and weight distribution of novice and advanced side-saddle riders in halt, walk, trot and canter on an equine simulator.

METHOD: 2-D motion analysis was used to determine the angles of the trunk, lower left leg, shoulder symmetry and pelvis symmetry of 8 advanced (ADV) riders and 10 novice (NOV) riders in the 4 conditions stated above. A Tekscan pressure pad was also placed between the simulator and saddle to assess weight distribution by calculating differences in peak pressure (PP).

Statistical analysis was performed using IBM SPSS version 24 for Mac. A non-parametric Mann Whitney U Test for difference ($P \leq 0.05$) was performed for the comparison of NOV and ADV riders for each positional angle as well as the comparison of PP symmetry.

	Dependent Variable	ADV (mean ± SD)	NOV (mean ± SD)	P Value ≤ 0.05
trunk angle	Halt	4.28 ± 3.451	3.98 ± 4.256	0.829
	Walk	3.23 ± 4.370	2.29 ± 4.354	0.965
	Trot	4.36 ± 4.310	2.81 ± 4.286	0.829
	Canter	7.39 ± 4.922	5.44 ± 2.794	0.360
lower leg angle	Halt	16.63 ± 3.623	14.21 ± 3.020	0.146
	Walk	16.67 ± 3.527	14.25 ± 2.746	0.173
	Trot	18.40 ± 3.373	17.08 ± 3.009	0.360
	Canter	15.00 ± 4.636	13.45 ± 3.049	0.360
shoulder symmetry	Halt	0.06 ± 1.009	1.21 ± 2.568	0.203
	Walk	0.55 ± 1.495	2.41 ± 1.812	0.034
	Trot	0.61 ± 1.099	1.69 ± 2.387	0.515
	Canter	0.89 ± 1.909	2.07 ± 1.969	0.237
pelvis symmetry	Halt	2.35 ± 1.624	4.41 ± 2.998	0.071
	Walk	3.48 ± 1.996	5.67 ± 2.865	0.043
	Trot	3.98 ± 2.143	6.19 ± 3.911	0.034
	Canter	3.89 ± 2.460	5.56 ± 3.552	0.083

Table 1: Kinematic 2-D motion analysis of the ADV and NOV groups

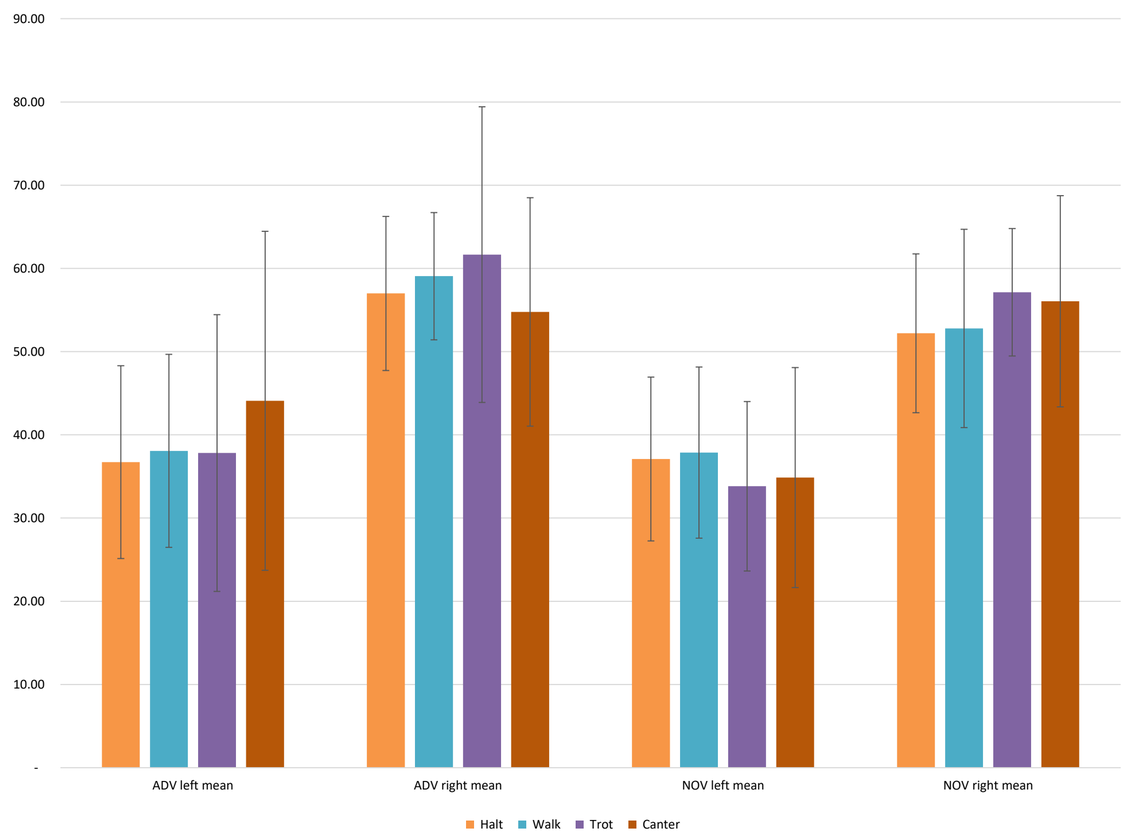

Figure 1: Left and right peak saddle pressure (kPa) for both NOV and ADV groups across all four conditions

Conclusion: This preliminary study has identified significant differences between the NOV and ADV riding styles in different gaits through kinematic and pressure distribution analysis. There is an abundance of research assessing the astride riding position and its influences on the horse which offers a platform for future studies assessing the side-saddle rider position. Out-of-saddle discipline specific exercises to improve rider symmetry and strength are increasing in popularity for the modern rider. Results identifying side-saddle rider asymmetries offer the potential for side-saddle specific exercises to be developed enabling a clear application to industry

Contact author: *Victoria.lewis@hartpury.ac.uk

Hartpury University