

A pilot study into the effect of a GPS and treeless saddle on the temperature of the horse's back and its freedom of movement

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The aim of this study was to compare gait variations (shoulder angles and stride length) in two differing saddle types; a treed GPS and a treeless Total Contact Saddle (TCS). The impact of heat variations on the back was also measured as this is a possible indicator of pain/inflammation. A random selection of six horses from a riding school population was chosen, and each horse was ridden by the same rider in an indoor school which was completely enclosed on a day with no appreciable wind to minimise any external temperature factors. Temperature was compared at start of the activity by a digital thermocouple and every minute for 10mins after from an area that would have been under the seat bones of the rider and on the horse's skin. The use of a Sports Motion Video Analysis System allowed stride characteristics to be taken from marked areas on the horse (point of the shoulder, highest point of the wither and mid point of the fetlock joint). A thermographic camera (FLIR Systems BCam) was also used to identify any 'hot spots' on the horse's back post exercise. The horses were first ridden in their own GPS saddle and then the Total Contact Saddle with a period of one day between each to allow the horse's back to come back to a base level. A Wilcoxon Signed Ranks Test was used to analyse the data. The results indicated that the mean stride and shoulder angle range was greater in the Total Contact Saddle in walk showing a mean of 1.85m v's 1.80m, $p=0.42$) and shoulder angle (14.90 deg v's 13.80 deg, $p=0.042$ but not the trot stride length (mean 1.86 v's 1.80 m, $p = 0.58$) it also produced significantly less temperature readings in both walk and trot ($p=0.04$ and $p=0.026$ resp). A potentially tissue damaging temperature of 41C was not reached at any time throughout the tests (mean temps in the GPS ranged from 34.2 to 36.2C and in the TCS from 32.6 to 34.4C). The exercise was only over 10 min and it might be hypothesised that a longer activity period and different environmental conditions may cause these to go much higher. The difference in stride parameters is of interest in dressage situations and potentially in jumping as well.