

Effects of Rider Weight and Pony Age on Epaxial Muscle Pain Sensitivity and Heart Rate Variability (HRV) in Exmoor Ponies: A Preliminary Study

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1. Introduction

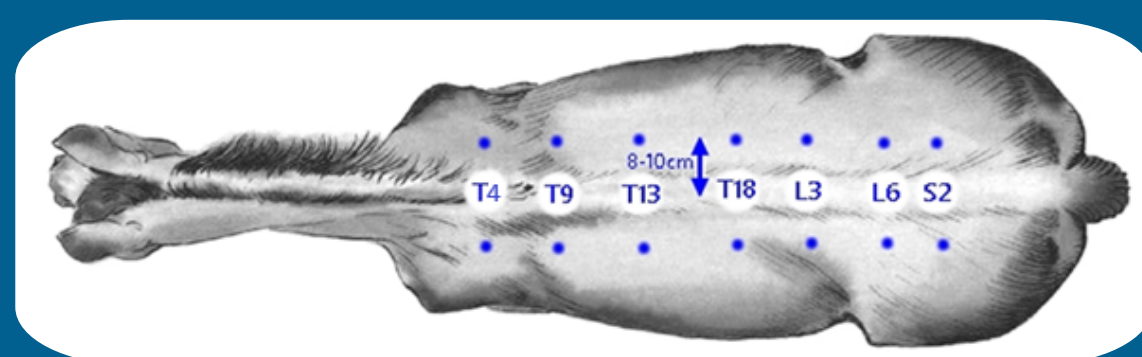
Welfare concerns surrounding horse-rider weight ratios are central to equestrianism's Social Licence to Operate and form the basis for much concern from potential physiological changes induced by heavier riders. Mechanical nociceptive thresholds (MNTs) are indicators of pain sensitivity with HRV indicative of a stress response.

2. Objectives

This crossover study investigated the impact of rider weight and pony age on epaxial muscle sensitivity to pain and HRV as a physiological stress factor.

3. Methods

- Ten trekking Exmoor ponies -18 ± 4 (13–25) years, body-weight (BW) 345.1 ± 25.9 (318–402) kg.
- Three riders (inc equipment) – lightweight (LW; 9.7–12.7% of BW), middleweight (MW; 13.9–17.6% of BW) and heavyweight (HW; 18.7–23.1% of BW).
- 4.28km trekking route at walk & trot, once per day, at the same time of day, for three consecutive days with each of the above riders (random allocation).
- Triplicate MNTs (per diagram) & HRV measured before, immediately after & two hours following the ride.



Location of triplicate MNTs

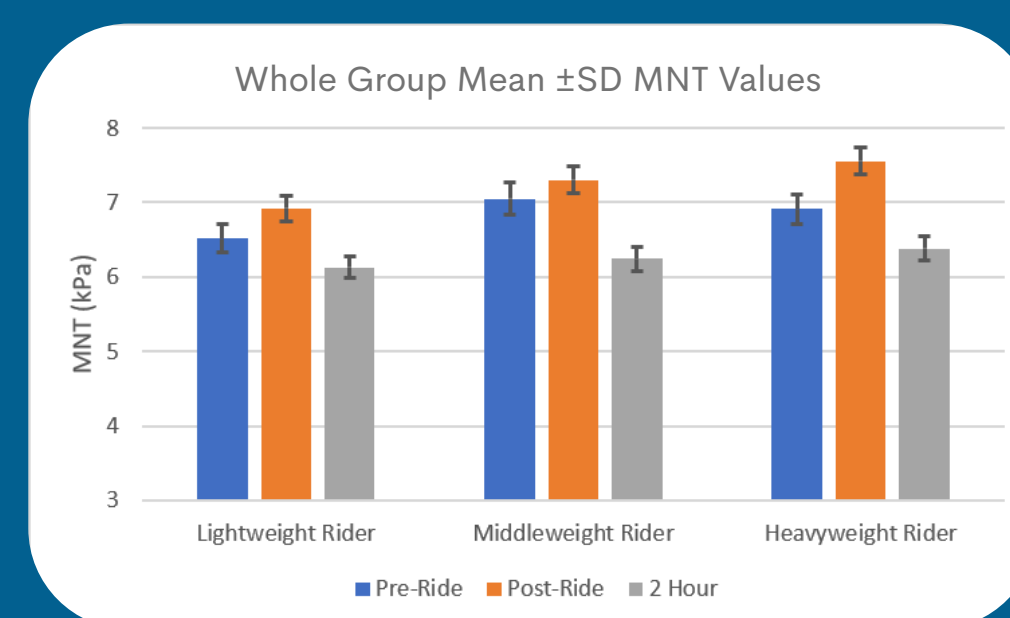
Datasets analysed between time points by ANOVA/T-test ($p < 0.017$).

4. Results

WHOLE GROUP EFFECTS

Immediately post ride: Mean sensitivity significantly decrease for HW rider ($p < 0.001$); notable at T4/T9 locations and at T9 under the LW rider ($p < 0.001$).

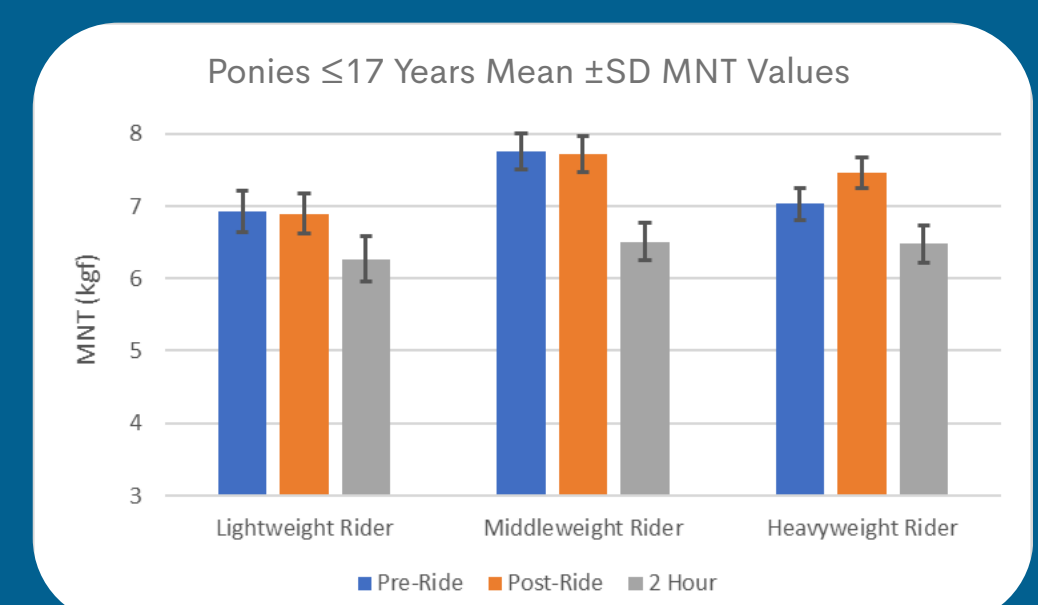
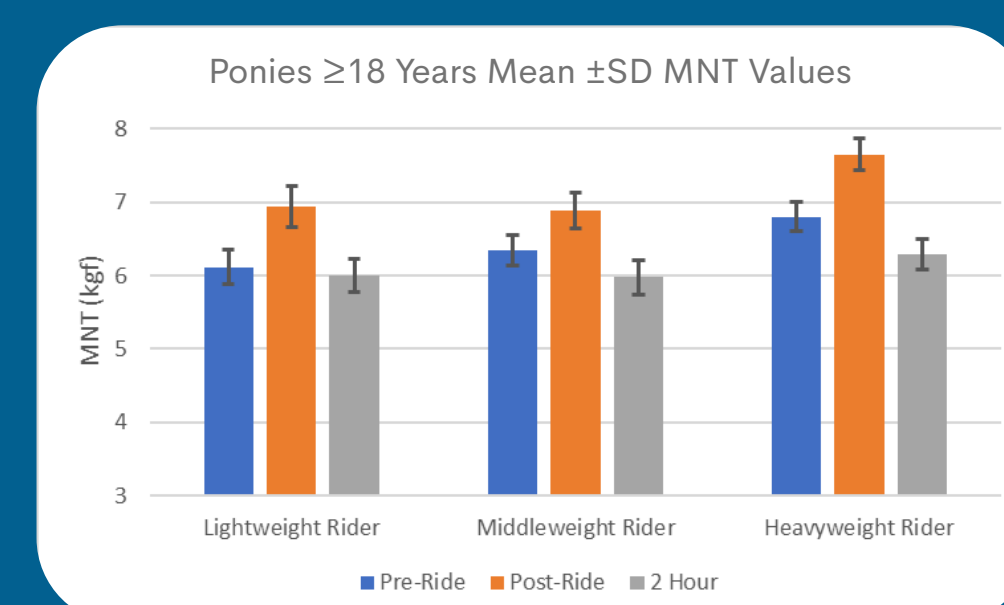
After two hour rest: Mean sensitivity significantly increases for all rider-weights compared to pre-ride ($p < 0.017$), notable caudal of T9 for MW & HW riders.



PONY AGE EFFECTS

Immediately post ride: Ponies ≥ 18 years ($n=5$) sensitivity significantly decreases for all rider weights; MW ($p=0.01$), LW/HW ($p < 0.001$). Ponies ≤ 17 years ($n=5$), sensitivity significantly decreases for HW ($p < 0.01$) rider only.

After two hour rest: Sensitivity significantly increased for all riders and pony ages during rest ($p \leq 0.005$). Ponies ≤ 17 years sensitivity significantly increased compared to pre-ride for LW/MW riders ($p \leq 0.001$).



HEART RATE VARIABILITY

Immediately post ride: Rider weight and pony age had no significant effect on HRV ($p > 0.017$).

After two hour rest period: Only LW rider induced a significant increase in HRV post ride -2hr ($p=0.007$).

5. Conclusions

- Post-exercise, immediate reductions in epaxial muscle pain sensitivity were consistently followed by increased tenderness two hours later, particularly in the mid-thoracic and lumborum regions.
- Older ponies showed stronger immediate reductions in epaxial muscle pain sensitivity and different recovery patterns, suggesting possible delayed onset tenderness.
- HRV indicated no sustained physiological stress.
- Further research is warranted with larger cohort/breed types and longevity of effects.

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