Could Pressure Algometry Support Clinical Signs in Referral of Suspected Overriding Dorsal Spinous Processes (ORDSP) in Horses?

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Introduction

ORDSP is a common cause of thoracolumbar pain, poor performance and reduced welfare in horses.
Field diagnosis relies largely on subjective clinical assessment.
Pressure algometry objectively measures mechanical nociceptive thresholds (MNTs) and may support veterinary referral.

Aim & Objectives

To determine whether dorsal spinous process (DSP) mechanical nociceptive thresholds can identify horses with ORDSP and support evidence-based veterinary referral.

Objectives

1. Compare DSP MNTs between study groups.
2. Assess relationships with lesion severity.
3. Assess relationships with clinical signs.
4. Develop a practical referral threshold

Methods and Materials

- A prospective controlled observational study was conducted with 50 horses divided into three groups: ORDSP (n=20), asymptomatic controls (n=20), and radiographically negative horses (n=10).
- Mechanical nociceptive thresholds were measured using a Wagner FDK100 digital pressure algometer at dorsal spinous processes from T10 to L6, and bilaterally at 10cm from midline, with triplicate recordings taken at each site.
- Clinical symptom scores and radiographic lesion counts were also recorded.
- Data were analysed using Shapiro-Wilk tests, independent t-tests, Spearman correlation, mixed-effects modelling, and ROC analysis.

Results

Mechanical Nociceptive Thresholds

ORDSP horses demonstrated significantly lower DSP MNTs than both control groups ($P < 0.001$).
No significant left–right differences were identified.

Correlation Analysis

Lower DSP MNTs were associated with:
Greater radiographic lesion count ($\rho = -0.61$, $P = 0.004$)
Greater clinical symptom burden ($\rho = -0.51$, $P = 0.02$)

ROC Analysis

Optimal referral threshold
DSPmin ≤ 4.08 kg/cm²
Sensitivity: 85%
Specificity: 90%
AUC: 0.90

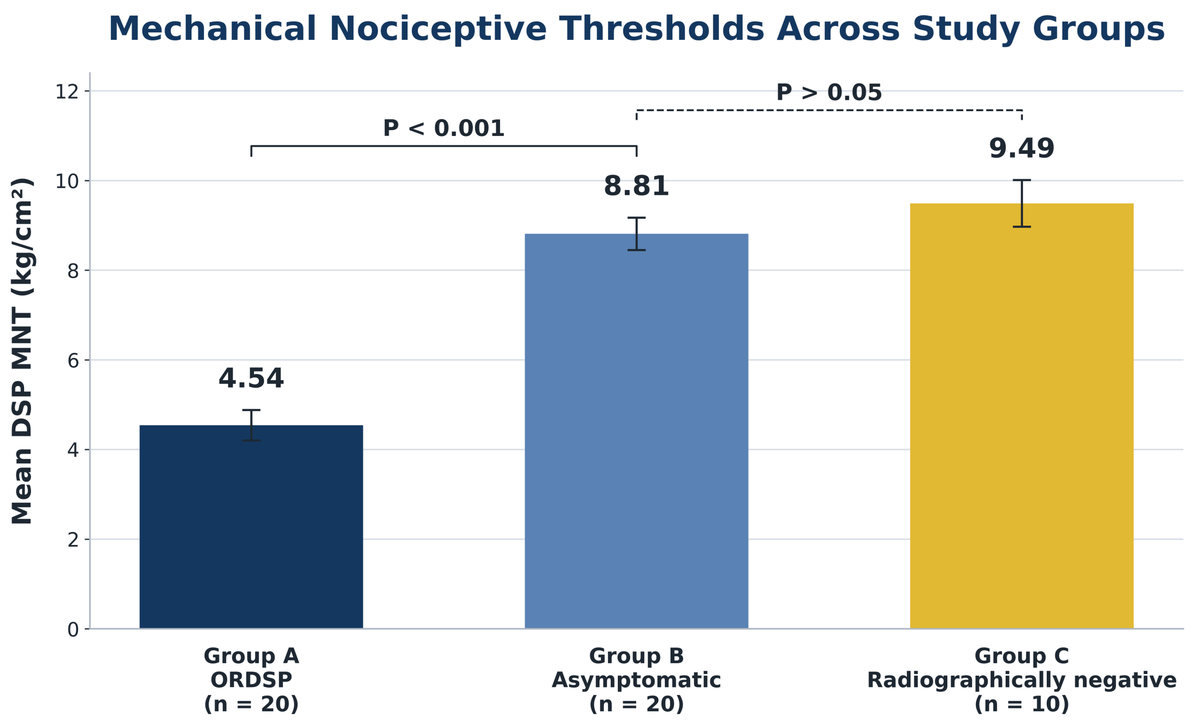
Clinical Implications

Pressure algometry is an objective adjunct to clinical examination.
Treatment history should always be considered when interpreting MNT values.
Combining DSP MNTs with clinical signs may improve evidence-based veterinary referral.

Conclusions

- ORDSP horses demonstrated significantly lower DSP MNTs than control horses.
- Lower MNTs reflected greater lesion severity and clinical symptom burden.
- DSPmin ≤ 4.08 kg/cm² combined with ≥5 compatible clinical signs may support veterinary referral.

Evidence Supporting the Referral Tool



Values are mean ± SD. DSP = dorsal spinous process; MNT = mechanical nociceptive threshold.

Proposed Clinical Referral Pathway

Step 1:
Are any of the DSP MNT readings below 4.08 kg/cm²?

Zero readings:
Unlikely to be Kissing Spine.
Monitor and consider other conditions/causes

Step 2:
Out of 45 readings how many are below 4.08 kg/cm²?

Fewer than 2 readings over 4.08 kg/cm²:
Likely normal variation
Monitor and consider other conditions/causes

3 to 12 readings over 4.08 kg/cm²:
Grey area – further assessment needed
Proceed to Step 3

More than 13 readings over 4.08 kg/cm²:
Horse likely to be experiencing significant back pain
Refer to Veterinarian

Step 3:
How many of the following symptoms/behaviours does the horse typically display?
1. Sensitivity to grooming **2.** Reluctance to stand still when mounting
3. Bucking, rearing or napping **4.** Stiffness, hollowing, or head tossing when ridden
5. Problems striking off in canter **6.** General Poor performance

2 symptoms or less?
Likely normal variation
Monitor and consider other conditions/causes

3 or 4 symptoms?
Horse may be experiencing back pain
Referral to veterinarian advised

5 symptoms or more?
Likely to be experiencing back pain
Refer to Veterinarian for further investigation

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