



NEURITIS PAIN AND PORCINE MODELS OF QUANTITATIVE SENSORY TESTING

Brianna French (Candace Floyd PhD, Quinn Tate MD)

Department of Physical Medicine and Rehabilitation

Background: Lower back pain is an extremely common pain symptom experienced by American adults. It can have a significant impact on many aspects of a person's life such as work, family, and overall health. Research on this subject and other spinal cord ailments have been done on rodents, but have not had strong success in translating results to a human clinical setting. This could be due to the differences in rodent size and anatomy. The porcine model provides a similar size and anatomical model to humans.

Purpose: Quantitative Sensory Testing (QST) is used to score pain responses in humans. By finding the changes in pain perception as it relates to low back pain in swine, it will be easier to translate to human clinical care. We wanted to find the level of accuracy of QST in animals and build an accurate way to measure their pain. It is hypothesized that using a preformulated pain scale, QST will show similar results to human trials. This study will lead to more studies on pain treatment using porcine models.

Methods: The pig undergoes surgery to stimulate inflammation in the lower sciatic nerve, causing hypersensitivity to one leg. After the procedure, the pig goes through QST. There are seven different tests that look at a variety of pain stimuli and how the pig reacts bilaterally. By testing bilaterally, a comparison between the affected side and non-affected side will be more apparent. These tests consist of hot and cold stimuli, pin pricks, pressure stimuli, and locomotion tests. After testing, the results are analyzed and scored using the Pig Evoked Pain Scale (PEPS).

Results: The surgery induced chronic pain and hypersensitivity. The Dynamic Mechanical Allodynia (ALL) test showed significant changes in pain perception at one week post-surgery. The Pressure Pain Threshold (PPT) test revealed that slightly less pressure was needed to produce a response in the Right Gluteus area after surgery. The Gastrocnemius is the same as region 1, the Gluteus is the buttock region, the Latissimus Dorsi are similar to region 8, and the Trapezius is similar to region 9. Cold Pain Threshold (CPT) showed an increase in sensitivity to cold after injury and increasing PEPS scores on region 1 of the affected side. Hot Pain Threshold (HPT) showed that the animal reacted more times after injury than before and increased PEPS scores. The remaining tests are still undergoing analysis, but we hypothesize that results will be similar to ALL, PPT, CPT, and HPT. This data is preliminary, and in the future, this research will lead to studies on sciatic pain relief.