CHRONIC PAIN RESPONSE IN MICE WITH EXPERIMENTAL AUTOIMMUNE ENCEPHALOMYELITIS

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Introduction

- Chronic pelvic pain (CPP) and neurogenic bladder (NGB), severe quality of life impairments, often occur in patients with multiple sclerosis (MS)
- Experimental autoimmune encephalomyelitis (EAE) is a widely used animal model for MS research
  - 2-3 weeks after immunization mice develop acute EAE often leading to severe multi-limb weakness and/or paralysis
  - As a confirmed model of MS, EAE mice present a unique opportunity to study CPP in MS
  - EAE mice exhibit a pattern of relapse/remission neuroparalytic cycles similar to patients with MS (Figure 1)

Methods

Animals

- Female SJL/J mice were immunized via subcutaneous injection to initiate EAE as described previously (Yu et al, 1996)

Evaluations

- Clinical scores (CS) were evaluated 15-30 days after induction of EAE based on 5 levels of neurological disability
  - 0: no disease
  - 1: decreased tail tone or slightly clumsy gait
  - 2: tail atony and/or moderately clumsy gait and/or poor righting ability
  - 3: limb weakness
  - 4: limb paralysis
  - 5: moribund state
- Twenty-four hour drinking and micturition were calculated by frequency volume chart as described previously (Altuntas et al, 2008)
- Visceral pain was assessed using calibrated von Frey hair monofilaments in ascending order of weight until a response was elicited (Figure 2)
  - The threshold was defined by the filament that elicited a noxious response >60% of the time

Results

- No significant difference in pain response was observed when comparing hind paw response at the early and late time periods
- At both time periods, heavier von Frey filament stimuli to the suprapubic region were required to elicit the same response in EAE mice with increasing clinical score

Conclusions & Future Directions

- EAE mice exhibit functional urologic patterns similar to patients with MS
- EAE causes neurologic disability in the animal model and demonstrates a dramatic contribution to pain response which proportionally worsens as the neurodegeneration progresses
- EAE mice can be a useful model system for studies of pathophysiology and treatment strategies of chronic pelvic pain in neurodegenerative diseases such as MS
- Future studies can establish biomarkers of initiation, progression and the role of pathways in NGB EAE mouse model

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