INTRODUCTION

Approximately 80% of Americans experience LBP during their lifetime. An estimated 15-20% develop protracted pain, and approximately 2-8% have chronic pain. Every year, 3-4% of the population is temporarily disabled, and 1% of the working-age population is disabled totally and permanently because of LBP.

The estimated yearly prevalence of LBP is 5-20% in the United States and 25-45% in Europe. In the United States, the estimated cost of LBP in 1980 was $85 million dollars. We aim to develop a suitable model for "Low Back Pain" (LBP) using SD rats to understand the abnormalities and mechanisms involved in this chronic pain.

MATERIAL AND METHODS

Model Induction - SD Rats, male 225-250g

Lumbar region exposed - L4- L5 facet identified

3 models:

CRUSH: crushed with hemostat. This was called the crush model.

COLLAGENASE: injected with collagenase. This model was called collagenase injection

CFA: a piece of gelatin sponge containing Complete Freund's Adjuvant will be inserted into the L5-L6 facet joint to produce arthritic joint

RESULTS

Figure 1: Mechanical Withdrawal Threshold in Rats with Facet Joint Crush

Figure 2: Vocalization Threshold to Pressure Algometer

Mechanical Withdrawal Threshold in Rats with Facet Joint Crush

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<thead>
<tr>
<th>Type of Surgery</th>
<th>Crush</th>
<th>CFA</th>
<th>Collagenase</th>
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<td>Surgery</td>
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<tr>
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<th>Crush</th>
<th>CFA</th>
<th>Collagenase</th>
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<tr>
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<td>CFA</td>
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Behavioural Testing

- Mechanical Hypersensitivity measured by von Frey filaments
- Rats acclimatized to VF chamber for 30min
- VF applied to the plantar surface of the hind paws to determine withdrawal threshold
- Each filament applied three times at 3 sec intervals
- 50% withdrawal threshold calculated

Algometer

- Sensitivity to pressure measured by Algometer in three positions
- Position 1: L5-L6 (identified by ilia)
- Position 2: L3-L4
- Position 3: L1-L2 (at the end of rib cage)

Imaging

- Upon Euthanasia of animal, Bone samples of interest are taken out as quickly as possible
- Bone samples with tissue surroundings are cleaned and removed, placed in 10% formalin.
- Imaging procedure done by X-ray
- Film is processed and quantified

Joint Histology

- Joint samples are put in 4% formalin in phosphate buffer overnight
- Samples are put into processing cassettes, placed in 1L beaker with stir bar~ 900ml of 4% formalin/10% EDTA.
- The beakers with the samples inside are put on magnetic stir plate for 3-3 ½ weeks
- The bone softens, the tissue is washed and cut for histology

CONCLUSIONS

- Collagenase injection into the lumbar facet joint does not appear to create a robust LBP model.
- Mechanical crush of the lumbar facet joint appears to be the most promising method for inducing a chronic LBP model for further evaluation and development.
- Further investigation into the CFA model as well as the mechanisms of LBP is required

ACKNOWLEDGEMENTS

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REFERENCES
