

ASSESSMENT OF THE EFFICACY OF DIFFERENT PHARMACOLOGICAL TREATMENTS IN A MODEL OF PARTIAL MENISCECTOMY-INDUCED OSTEOARTHRITIS IN FEMALE RATS

Zanon A., Maffre V., Darbaky Y. and Diop L.

POSTER
483.09

Society for Neuroscience

SfN's 49th Annual Meeting

Chicago, IL : October 19-23, 2019 

ASSESSMENT OF THE EFFICACY OF DIFFERENT PHARMACOLOGICAL TREATMENTS IN A MODEL OF PARTIAL MENISCECTOMY-INDUCED OSTEOARTHRITIS IN FEMALE RATS



Zanon A., Maffre V., Darbaky Y. and Diop L.
ANS Biotech, Biopôle Clermont Limagne, Site de Riom La Varenne, Riom, France

#483.09

Introduction

Osteoarthritis (OA) is a degenerative disease involving several joint tissues, characterized by damages to the articular cartilage.

The partial meniscectomy model presents similarities to human OA with cartilage damage, subchondral bone remodeling, and presence of osteophytes. Symptomatically, the partial meniscectomy model has been described as inducing evoked pain (tactile allodynia).

The objective of this study was to evaluate the activity of different pharmacological treatments (opioid receptor agonists, nonsteroidal anti-inflammatory drug (NSAID) and local anaesthetic) on mechanical allodynia in a model of partial meniscectomy-induced OA in female rats.

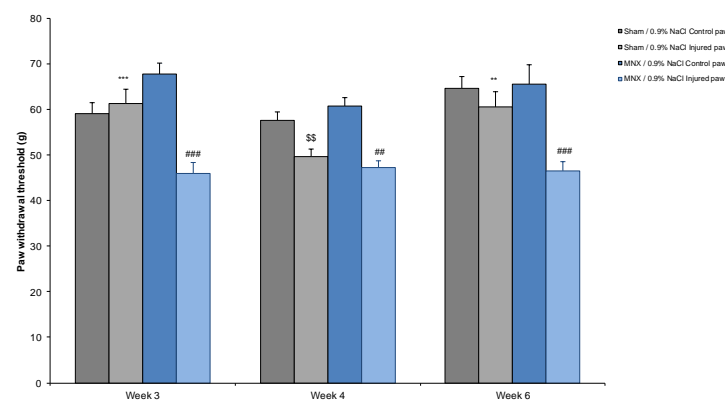
Materials and Methods

Adult female Lewis rats were anesthetized before partial resection of medial meniscus.

On week 3 after surgery, animals received an acute administration of Morphine, Diclofenac or 0.9% NaCl.

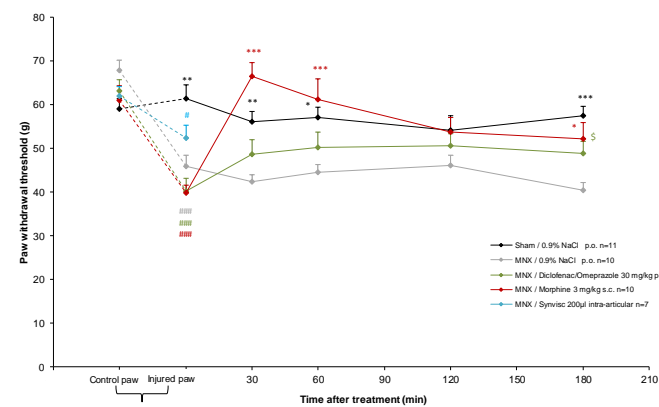
On week 6 after surgery, animals received an acute administration of Tramadol, Bupivacaine or 0.9% NaCl. Tactile sensitivity of both hindpaws was measured before and after treatment, on week 3 and 6, using electronic Von Frey.

Partial meniscectomy-induced osteoarthritis in female rats (mechanical allodynia): stability throughout the time.



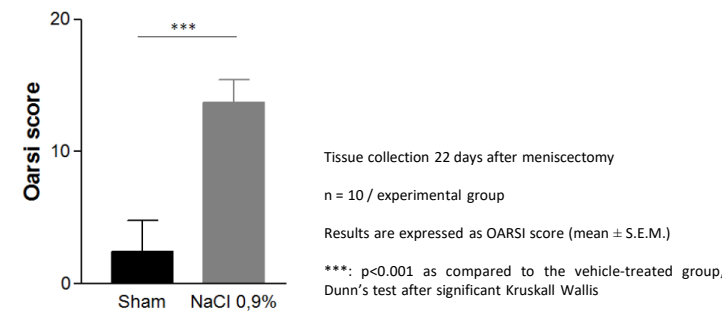
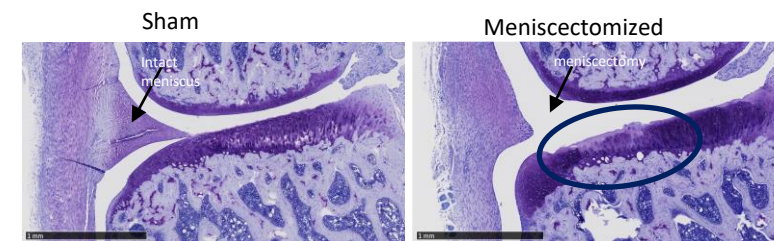
Results are expressed as mean ± s.e.m. ##, ###: p<0.01 and 0.001, respectively, as compared to the control paw of the corresponding group, Bonferroni's test after significant two-way ANOVA. **, ***: p<0.01 and 0.001, respectively, as compared to the control paw of the vehicle-treated group, Bonferroni's test after significant two-way repeated measures ANOVA. \$\$: p<0.01, as compared to the sham control paw, Bonferroni's test after significant two-way ANOVA.

Effect of Diclofenac and Morphine in a model of partial meniscectomy-induced osteoarthritis in female rats (mechanical allodynia): week 3.



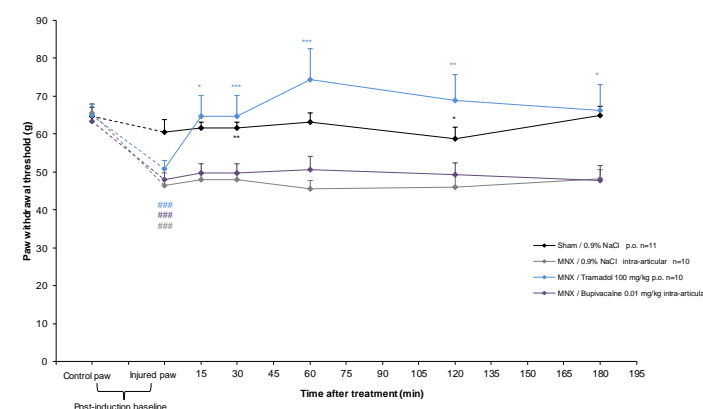
Results are expressed as mean ± s.e.m. #, ###: p<0.05 and 0.001, respectively, as compared to the control paw of the corresponding group, Bonferroni's test after significant two-way ANOVA. *, **, ***: p<0.05, 0.01 and 0.001, respectively, as compared to the vehicle-treated group, Bonferroni's test after significant two-way repeated measures ANOVA. \$: p<0.05 as compared to the vehicle-treated group, Student's t-test.

Toluidine blue coloration of tibio-femoral articulations 3 weeks after meniscectomy.



Tissue collection 22 days after meniscectomy
n = 10 / experimental group
Results are expressed as OARSI score (mean ± S.E.M.)
***: p<0.001 as compared to the vehicle-treated group, Dunn's test after significant Kruskal Wallis

Effect of Tramadol and Bupivacaine in a model of partial meniscectomy-induced osteoarthritis in female rats (mechanical allodynia): week 6.



Results are expressed as mean ± s.e.m. ###: p<0.001 as compared to the control paw of the corresponding group, Bonferroni's test after significant two-way ANOVA. *, **, ***: p<0.05, 0.01 and 0.001, respectively, as compared to the vehicle-treated group, Bonferroni's test after significant two-way repeated measures ANOVA.

Results

Partial meniscectomy surgery induced, from 3 weeks to 6 weeks after partial resection of medial meniscus, a reduced and stable paw withdrawal threshold in the vehicle-treated group as compared to the sham-operated controls. On week 3, a single subcutaneous administration of Morphine 3 mg/kg induced, in dose and time related manner, an antiallodynic effect in a model of partial meniscectomy-induced OA. In the same experimental conditions, Diclofenac 30 mg/kg po exhibited moderate antiallodynic effect. On week 6, a single oral administration of Tramadol 100 mg/kg produced, in dose and time related manner, a marked antiallodynic effect. Bupivacaine intra-articularly administered at 0.01 mg/kg did not induce any significant effect in a model of partial meniscectomy-induced OA.

Conclusion

In the model of partial meniscectomy-induced OA, opioid receptor agonists showed marked antiallodynic effects. The hypersensitivity was reduced by treatment with a NSAID but not with local anaesthetic in the model of OA.



October, 19-23, Chicago, IL, USA

**YOUR PARTNER FOR THE
PRECLINICAL PHARMACOLOGY OF PAIN**



CONTACTS

> Dr. Yassine **DARBAKY**
Chief Business Officer
yassine.darbaky@ans-biotech.com
+33 (0)9 70 75 85 02

> Julie **CHAMALET**
Business Development Assistant
julie.chamalet@ans-biotech.com
+33 (0)9 70 75 85 02

www.ans-biotech.com