The effectiveness of a marine-based fatty acid compound (PCSO-524) alone and combined with firocoxib in the treatment of canine osteoarthritis

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INTRODUCTION

Osteoarthritis is a common problem in dogs associated with low grade synovitis leading to clinical signs of pain, lameness and stiffness. Nonsteroidal anti-inflammatory drugs (NSAIDs) are commonly used to treat osteoarthritis, but side effects prevent use in some dogs. Marine based fatty acids have been found to possess anti-inflammatory properties by leading to production of a less bioactive form of the inflammatory mediators associated with osteoarthritis.[1] Marine based fatty acids have been also been found to improve vertical ground reaction forces in a similar fashion to NSAIDs.[2] The purpose of this study is to assess the effectiveness of a marine-based fatty acid compound alone and in combination with firocoxib (an NSAID) for treatment of osteoarthritis in dogs by evaluating peak vertical force and the canine brief pain inventory.

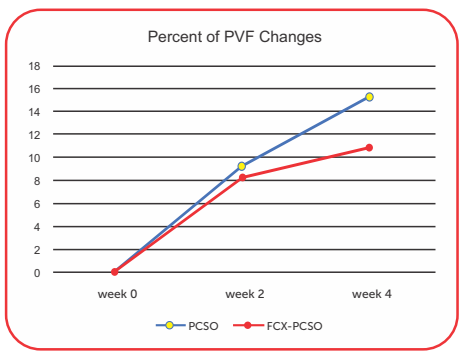

Figure 1 – Changes in Peak Vertical Force values over time expressed as a percentage.

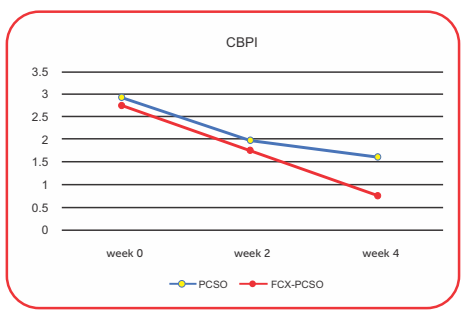

Figure 2 – Overall mean CBPI scores (combined pain and pain interference sections) over time.

MATERIALS AND METHODS

STUDY DESIGN:
Double-blind randomized prospective clinical trial

INCLUSION CRITERIA:
Mature dogs over 1 year of age of either gender, between 18-50 kg with a Purina BCS of 5-9. Dogs had radiographic OA of stifles (mild or moderate) and were clinically lame and able to trot across force plate.

EXCLUSION CRITERIA:
abnormal hematologic or blood chemistry values, any other systemic or concurrent disease, dogs having any joint surgery within 8 months, pregnant or lactating bitches.

ORAL PRODUCTS:
PCSO-524 (PCSO) (Antinol, Boehringher Ingelheim)
Firocoxib (FCX) (Previcox and Antinol, Boehringher Ingelheim)

TREATMENT GROUPS:
PCSO-524 (PCSO) 200 mg (active ingredient) q24h for 4 weeks
Firocoxib + PCSO-524 (FCX-PCSO)
200 mg (active ingredient) q24h for 4 weeks (PCSO)
5 mg/kg q24h for 4 weeks (FCX)

OUTCOME MEASURES:
Computer-assisted force plate gait analysis was performed (OR6-7, AMTI, Watertown, MA). Dogs were trotted across the dual force plate at 0, 2 and 4 weeks. For each dog, the same velocity range of 1.3-2.0 m/sec and acceleration range within 0.5 m/s2 was maintained. A valid trial was defined as the ipsilateral fore and hind limb strike on the force plate when trotting and was verified by video. Owners completed the CBPI at times 0, 2 and 4 weeks.

STATISTICAL ANALYSIS:
Peak vertical force from the first valid trials were averaged and evaluated by the repeated measurement analysis using a general linear model with significant level set at 5% (α = 0.05). For within group comparison, the Turkey's Studentized Range was used for multiple comparisons (α = 0.05). Patients were also evaluated using the University of Pennsylvania's CBPI tool. Data was analyzed using the repeated measurement analysis using a genera linear model with significant level set at 5% (α = 0.05).

STUDY LIMITATIONS

- This study was designed as a pilot study for a larger multiinstitutional study
- no placebo group
- no FCX group
- small sample size
- short duration of study

RESULTS

The repeated measurement analysis (comparison between groups) demonstrated a non-significant effect of the treatment on the adjusted PVF values (p= 0.4447) among the two treatment groups. The interaction effect was insignificant. The comparison within group revealed significant increases in the PVF values at week 2 and week 4 treatments compared to their pre-treatment values in both group ($p<0.05$) (Figure 1). Changes in mean PVF of 7.81±1.27and 6.19±1.58 %BW (mean±SE) were detected in the PCSO-524 and FCX-PCSO groups, respectively. (Figure 1)

The repeated measurement analysis (comparison between groups) demonstrated a non-significant effect of the treatment on the CBPI values (p = 0.4359) among the two treatment groups. The interaction effect was insignificant. The comparison within the PCSO group revealed a significant decrease in the CBPI values at week 2 and 4 compared with the pre-treatment values ($p<0.05$). The comparison within the FCX-PCSO group revealed a significant decrease in the CBPI values at week 4 compared with the pre-treatment values ($p<0.05$). (Figure 2)

DISCUSSION/CONCLUSION

This pilot study showed improvement in peak vertical ground reaction forces and CBPI compared to baseline in dogs having osteoarthritis at 2 and 4 weeks after treatment in the PCSO and FRX-PCSO groups. No significant difference was seen between groups. These data suggest that marine-based PCSO-524 alone, and the combination of firocoxib and PCSO-524 are equally beneficial in treating dogs with osteoarthritis. Further investigation is warranted to determine the beneficial effects of PCSO-524 alone.

REFERENCES

1. Sanderson RO, et al. Vet Record 2009;164(14):418-424.
2. Kwanancha, et al. Thai J Vet Med 2016;46(3):363-371.

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Podium Abstracts

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The Effectiveness of Marine-Based Fatty Acid Compound (PCS0-524) Alone and Combined with Previcox in the Treatment of Canine Osteoarthritis

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Congress Abstract | Full Text

Introduction: The purpose of this study is to assess the effectiveness of a marine-based fatty acid compound alone and in combination with firocoxib (a NSAID) for treatment of osteoarthritis-associated pain in dogs using objective measures of limb use and validated subjective assessments.
Materials and Methods: A randomized prospective clinical trial was performed with 31 dogs. Dogs were randomly allocated to a PCSO-524 group (PCSO) or a Firocoxib + PCSO-524 (FCX-PCSO) group. Owners were masked to the presence of firocoxib by using identical placebo tablets in the PCSO-524 group. Force plate gait analysis and the owner-completed Canine Brief Pain Inventory tool were used to evaluate patients at 0, 2 and 4 weeks. Data were analyzed using repeated measurement analysis with significant level set a 5% (a= 0.05).
Results: Peak vertical force (PVF) values were significantly increased over baseline at week 2 and week 4 in both groups ($p < 0.05$). A significant decrease in the CBPI scores (improvement) was seen in both groups at week 2 and week 4 ($p < 0.05$) compared with the pre-treatment values. No differences were seen between the groups.
Discussion/Conclusion: These data suggest that marine-based PCSO-524 alone, and the combination of firocoxib and PCSO-524 are equally beneficial in treating dogs with osteoarthritis. Further investigation is warranted to determine the beneficial effects of PCSO-524 alone.

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