

# RANDOMIZED, DOUBLE-BLINDED, CONTROLLED CLINICAL TRIAL EVALUATING THE EFFICACY OF A DIET SUPPLEMENTED WITH CURCUMINOIDS EXTRACT, HYDROLYZED COLLAGEN AND GREEN TEA EXTRACT IN DOGS SUFFERING FROM OSTEOARTHRITIS

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**PURPOSE** We have previously demonstrated that a mixture of curcuminoids extract, hydrolyzed collagen and green tea extract (COT) inhibited inflammatory and catabolic mediator's synthesis by normal bovine and osteoarthritic human chondrocytes<sup>a</sup>. A randomized, double-blinded, placebo-controlled clinical trial was performed to evaluate the efficacy of a diet supplemented with this COT mixture on clinically affected OA dogs.

**METHODS** Forty-two client-owned dogs with OA were randomly assigned to receive for 3 months standard food (n=21) (control) or same diet supplemented with COT mixture (n=21) (COT). At inclusion and after 3 months of diet (T3), an examination was performed by veterinarians and dogs were scored for lameness (1 to 5), pain at palpation (1 to 5), pain at manipulation (0 to 10) and joint mobility (1 to 5). Ground reaction forces (peak vertical force) (PVF) were recorded using force plate at study start (T0) and T3 with velocity of 1.8 to 2.2 m/s and acceleration-deceleration variation of  $\pm 0.5$  m/s<sup>2</sup>. Owners evaluated their dog condition by completing a validated Canine Brief Pain Inventory (CBPI)<sup>b</sup> at T0 and T3, assessing pain severity (PS) and pain interference (PI). Dogs were weighed each month. All data were expressed as mean  $\pm$  standard error mean. Generalized linear model or mixed model were used and analyzed using SAS 9.3 for statistical analysis. A p-value  $\leq 0.05$  was considered as statistically significant.

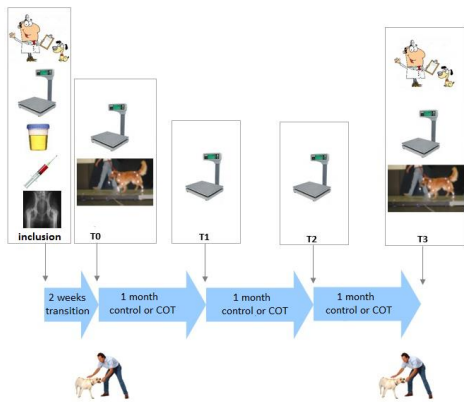


Figure 1. Study design

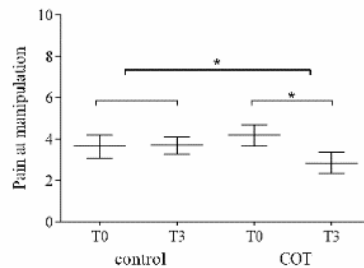


Figure 3. Box plot for pain at manipulation for control and COT groups at study start (T0) and study end (T3) in 42 client-owned dogs with OA assigned to receive a control food (n=21) or a COT food (n=21). \* $p < 0.05$ . There was a beneficial effect for pain at manipulation in the COT group (T0:  $4.19 \pm 0.52$ ; T3:  $2.86 \pm 0.51$ ,  $p = 0.037$ ) but not in the control group (T0:  $3.65 \pm 0.56$ ; T3:  $3.7 \pm 0.4$ ,  $p = 0.999$ ). Moreover, there was a significant difference between COT and control groups for pain at manipulation ( $p = 0.036$ ).

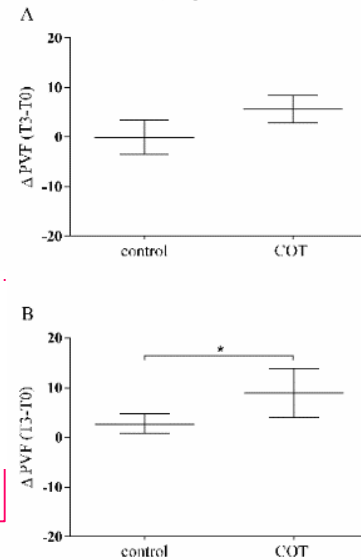


Figure 2. Box plot for  $\Delta$  peak vertical force (PVF) in total population (n= 21 control + 21 COT) (A) or in younger dogs subgroup (n= 15 control + 11 COT) (B) of client-owned dogs with OA assigned to receive a control food or a COT food. \* $p < 0.05$ . There was no significant PVF change in control group (T0:  $69.65 \pm 4.33$  % BW; T3:  $69.63 \pm 3.18$  % BW;  $p = 0.999$ ) and in COT group (T0:  $61.81 \pm 2.52$  % BW; T3:  $67.44 \pm 3.32$  % BW;  $p = 0.283$ ) in total population. However, in younger dog's subgroup (60th percentile: 8.7 years old, mean age:  $5.8 \pm 0.4$  years old, n=11 test + 15 control), the change for PVF ( $\Delta$  T3-T0) was significantly better in COT group (T0:  $61.12 \pm 3.8$  % BW; T3:  $70.11 \pm 6.06$  % BW) than in control group (T0:  $66.49 \pm 3.97$  % BW; T3:  $69.22 \pm 3.72$ ) ( $p = 0.049$ ).

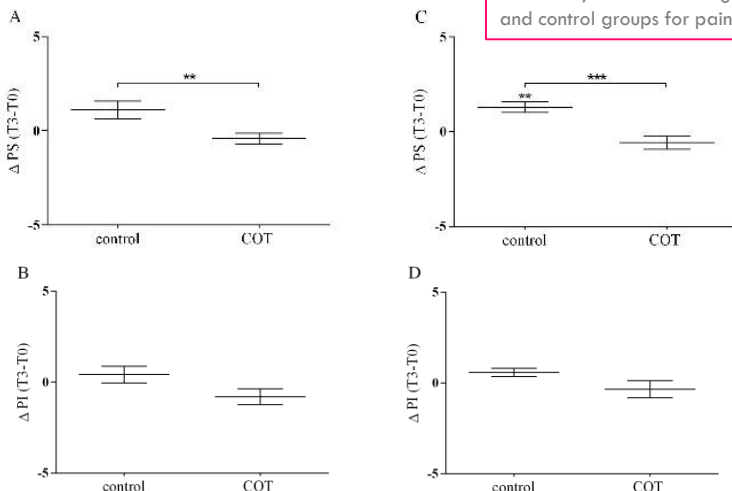


Figure 4. Box plot for  $\Delta$  pain severity (PS) (A, C) and  $\Delta$  pain interference (PI) (B, D) in total population (n= 21 control + 21 COT) (A, B) or in younger dogs subgroup (n= 15 control + 11 COT) (C, D) of client-owned dogs with OA assigned to receive a control food or a COT food. \*\* $p < 0.01$  \*\*\* $p < 0.001$  The change for PS ( $\Delta$  T3-T0) was significantly different between COT (T0:  $2.67 \pm 0.4$ ; T3:  $2.42 \pm 0.38$ ) and control (T0:  $2.46 \pm 0.45$ ; T3:  $3.58 \pm 0.51$ ) groups in total population ( $p = 0.009$ ) (A). There was no significant difference for PI between COT and control groups in total population ( $p = 0.063$ ) (B). In younger dog's subgroup (60th percentile: 8.7 years old, mean age:  $5.8 \pm 0.4$  years old, n=11 test + 15 control), PS increased significantly between T0 and T3 in the control group (T0:  $2.4 \pm 0.52$ ; T3:  $3.7 \pm 0.59$ ,  $p = 0.007$ ) but slightly decreased in the COT group (T0:  $1.82 \pm 0.41$ ; T3:  $1.25 \pm 0.43$ ,  $p = 0.463$ ). There was a significant difference in younger dog's subgroup between COT and control groups for PS ( $p < 0.001$ ) (C). There was no significant difference for PI between COT and control groups in younger dog's subgroup ( $p = 0.070$ ) (D).

## CONCLUSIONS

Dogs receiving diet were less painful after 3 months. The difference of evolution between groups suggests that a longer treatment may be necessary to reach a stronger effect on other evaluation parameters. Improvement of lameness have been observed, but only in younger dog's subgroup. ■

<sup>a</sup> Comblain F, Sanchez C, Lesponne I, Balligand M, Serisier S, Henrotin Y. Curcuminoids Extract, Hydrolyzed Collagen and Green Tea Extract Synergically Inhibit Inflammatory and Catabolic Mediator's Synthesis by Normal Bovine and Osteoarthritic Human Chondrocytes in Monolayer. PLoS One. 2015;10(3):e0121654

<sup>b</sup> Brown DC, Boston RC, Coyne JC, Farrar JT. Ability of the canine brief pain inventory to detect response to treatment in dogs with osteoarthritis. Journal of the American Veterinary Medical Association 2008; 233: 1278-83