which could indicate GOA. The background of GOA was investigated by epidemiological analysis of peri-articular osteophytes of major six joints in a skeletal population.

**070**

**AGE-RELATED BEHAVIOR OF COLLAGEN AND PROTEOGLYCAN IN SUPERFICIAL, MIDDLE AND DEEP ZONES OF PATELLAR CARTILAGE: FOURIER TRANSFORM INFRARED SPECTROSCOPY (FTIR) ANALYSIS OF NORMAL RABBITS**

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**Purpose:** To detect the collagen content and proteoglycan content in the superficial, middle and deep zones of articular cartilage is a trend but still technical challenge. Fourier transform infrared spectroscopy (FTIR) is powerful tool to investigate the collagen and proteoglycan in cartilage matrix. The FTIR quantifies the collagen content and proteoglycan content on histologic sections of cartilage. Because the FTIR maps the distribution of collagen and proteoglycan on the sections, the collagen and proteoglycan can be analyzed in the superficial, middle and deep zones of cartilage. Age-related behavior of the collagen and proteoglycan in each zone of patellar cartilage has not been reported yet. Therefore, the objective of this pilot study is to investigate the behavior of the collagen and proteoglycan in each zone using the FTIR.

**Methods:** Non-treated five rabbits of various ages (3-week, 6-month, 1-year, 2.5-year) were examined. Specimens of patella were removed from each rabbit and all specimens were observed macroscopically and confirmed that the cartilage surface was smooth and glossy. Specimens were then prepared and sagittal sections were cut for histology and for the FTIR. The sections stained with safranin-O/fast green were observed using a light microscopy and confirmed that no fibrillation or no degenerative change had occurred. The sections for the FTIR were not stained. The integrated area of collagen Amide I (wave, 1590-1720 cm⁻¹) was defined as collagen content. The integrated area of proteoglycan can sugar ring C-O absorbance (wave, 985-1140 cm⁻¹) normalized by Amide I area was defined as proteoglycan content. The superficial, middle, deep and whole zones of cartilage were defined as the area from surface to 100 μm depth, 100 μm to 400 μm, 400 μm to 600 μm and surface to 600 μm, respectively. Mean collagen content and mean proteoglycan content of the each zone were calculated and compared.

**Results:** Collagen content in the superficial zone was the lowest in the 3-week animal and the highest in the 6-month animal (Fig. 1A). Collagen content in the middle, deep and whole zones was the lowest in the 3-week animal and the highest in the 2.5-year animal (Fig. 1A). Proteoglycan content in the superficial, middle and whole zones was the highest in the 6-month animal (Fig. 1B). Proteoglycan content in the deep zone was the highest in the 3-week animal (Fig. 1B). Proteoglycan content in the middle, deep and whole zones was the lowest in the 2.5-year animal (Fig. 1B).

**Conclusions:** The FTIR successfully detected the age-related behavior of collagen and proteoglycan in each zone of patellar cartilage. Because number of animals was limited, further study is needed.

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**Animal models**

**071**

**ORAL TREATMENT WITH THE PLANT EXTRACT OF BRACHYSTEMMA CALYCINUM D. DON REDUCES THE DEVELOPMENT OF CARTILAGE LESIONS IN EXPERIMENTAL DOG OSTEOARTHRITIS: INHIBITION OF PROTEASE ACTIVATED RECEPTOR-2**

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**Purpose:** There is an obvious need for safe and effective new agents that can stop the progression of osteoarthritis (OA). Botanical medicinal products or neutraceuticals used for the treatment of OA in general have been demonstrated to have better tolerability than classical drugs. J&L is a plant extract prepared from Brachystemma calycinum D. don, a plant classically used in Chinese medicine for the treatment of musculoskeletal diseases. The aim of this study was to evaluate the potential protective effect of J&L on the in vivo development of OA lesions in the experimental dog anterior cruciate ligament (ACL) transection model and to document its mechanism of action.

**Methods:** OA was induced by sectioning the ACL of the right knee in crossbred dogs. There were two treatment groups (n=6-7 dogs/group): placebo and J&L at a therapeutic dosage (200 mg/kg/day), given orally for the entire duration of the study (8 weeks). Macropscopic and histopathological evaluations of cartilage lesions on the femoral condyles and tibial plateaus were performed. Moreover, immunohistochemical analyses of cartilage assessing the levels of iNOS, MMP-13 and protease activated receptor (PAR)-2 were done.

**Results:** Treatment with J&L reduced the severity of cartilage OA lesions. More specifically it reduced the depth of cartilage lesions on the tibial plateaus with a significant effect on the femoral condyles (p≤0.04). J&L treatment significantly decreased (p≤0.02) the histopathological score on both femoral condyles and tibial plateaus; the main effect was observed on structural changes and cellularity. J&L also significantly reduced the level of key inflammatory and catabolic factors, iNOS (p≤0.009) and MMP-13 (p≤0.003), as well as the level of PAR-2 (p≤0.03).

**Conclusions:** This study demonstrates that the J&L can have a protective effect on the development of experimental OA articular (or joint) structural changes. This effect was associated