

**References:**

- [1] Sofat N, et al. Journal of Biomedical Graphics and Computing, 2013, 3(4). doi: 10.5430/jbgc.v3n4p20.
- [2] Wajed J, et al. International Journal of Rheumatology 2012; 2012:703138.

**Acknowledgements:** We acknowledge support from the Rosetree's Trust and the NIHR Clinical Research Network.

**Disclosure of Interest:** None declared

**DOI:** 10.1136/annrheumdis-2017-eular.3537

**SAT0531 MATRIX ASSISTED LASER DESORPTION IONIZATION IMAGING MASS SPECTROMETRY APPLIED TO HUMAN OSTEOARTHRITIS CARTILAGE REVEALS THE INTRA-TISSUE METABOLIC HETEROGENEITY**

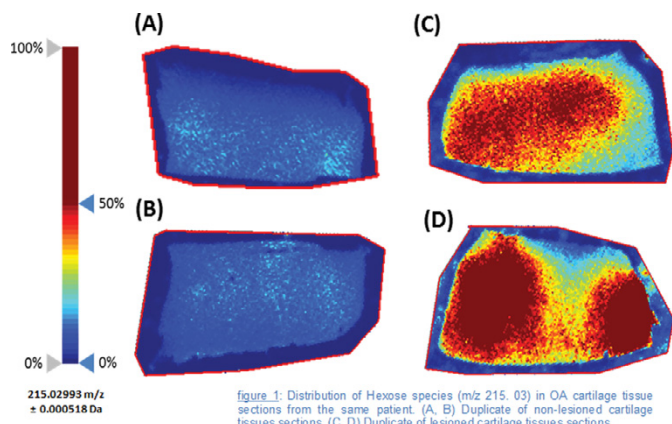
M. Eveque-Mouroux<sup>1</sup>, P. Emans<sup>2</sup>, T. Welting<sup>2</sup>, A. Boonen<sup>3</sup>, R. Heeren<sup>1</sup>, B. Cillero-Pastor<sup>1</sup>. <sup>1</sup>Division of Imaging Mass Spectrometry, Maastricht MultiModal Molecular Imaging (M4I) Institute; <sup>2</sup>Department of Orthopaedic Surgery; <sup>3</sup>Caphri Research institute, Maastricht University Medical Center, Maastricht, Netherlands

**Background:** Osteoarthritis (OA) is one of the most common diseases, caused by a chronic degenerative disorder of the joint. OA can be related to the metabolic syndrome or metabolic abnormalities being recently defined as a subtype of the disease<sup>1</sup>. Matrix-assisted laser desorption/ionization (MALDI) imaging mass spectrometry (IMS) technology allows for the investigation of the bimolecular distribution of proteins, lipids or metabolites through the in situ analysis of tissue sections. In order to better understand the metabolic OA phenotype, the study of the endogenous metabolic profiles using MALDI-IMS should be considered.

**Objectives:** The main goal of this study is to apply MALDI-IMS methodology to study the metabolic spatial distribution of cartilage and to reveal intra-tissue and inter-patient heterogeneity.

**Methods:** Human OA cartilage was obtained from donors undergoing total knee joint replacement. Samples were heat stabilized by a stabilizer system, before being snap frozen. Cartilage punches were sectioned at 12 µm thickness in a cryostat and deposited on indium tin oxide (ITO) glass slides. 9-Aminoacridine (9AA) and N-(1-Naphthyl) Ethylenediamine Dihydrochloride (NEDC) matrices were sprayed on the tissues. MALDI-MS profiling and imaging experiments were performed using different mass spectrometers. Data were analyzed by different software dedicated to mass spectrometry.

**Results:** Results showed that 9AA and NEDC matrices were both able to extract several and different compounds. MALDI-MS/MS was employed with 9AA matrix for molecular identification, confirming for the first time the presence of several metabolites in cartilage such as adenosine triphosphate, adenosine diphosphate, uridine triphosphate or N-Acetylglucosamine. Punches from lesioned and non-lesioned areas from the same OA patient were heat stabilized and sprayed with NEDC matrix. MALDI-IMS experiments at 40-µm of spatial resolution showed a different metabolic distribution between deep and superficial areas but also between lesioned and non-lesioned regions suggesting an evidence in the existence of intra-tissue heterogeneity (figure 1).



**Conclusions:** MALDI-IMS methodology is a useful technique for metabolite profiling of cartilage and could be employed to study OA patient heterogeneity. This fact will be especially relevant for OA patients suffering of metabolic syndrome.

**References:**

- [1] Zhuo, Q., et al. (2012). Metabolic syndrome meets osteoarthritis. *Nat Rev Rheumatol* 8(12): 729–737.

**Disclosure of Interest:** None declared

**DOI:** 10.1136/annrheumdis-2017-eular.6498

**SAT0532 SLEEP QUALITY IN PATIENTS WITH KNEE OSTEOARTHRITIS**

M. Sezgin<sup>1</sup>, E. Yeşildal<sup>1</sup>, S. Sevim<sup>2</sup>, H. Ankaralı<sup>3</sup>, G. Sahin<sup>1</sup>. <sup>1</sup>Department of Physical Medicine and Rehabilitation; <sup>2</sup>Department of Neurology, Mersin University Medical Faculty, Mersin; <sup>3</sup>Department of Biostatistics and Medical Informatics, Duzce University Medical Faculty, Düzce, Turkey

**Objectives:** The aim of this study was to investigate sleep quality in patients with knee osteoarthritis (OA).

**Methods:** One hundred patients with knee OA and age and gender-matched 75 healthy controls were enrolled into the study. Demographic characteristics of the participants were recorded. All patients was examined by a single physician, the findings were recorded. Knee radiographs of the patients were staged according to the Kellgren-Lawrence grading. In addition, to evaluate the clinical status and quality of life of patients was performed Western Ontario ve McMaster Universities Osteoarthritis Index (WOMAC) and Nottingham Health Profile (NHP). The sleep quality of two groups with MOS sleep scale and polysomnography (PSG) were subjectively and objectively evaluated.

**Results:** All scores of MOS sleep scale were significantly lower in patients with knee OA than controls ( $p < 0.001$ ). When PSG outcomes of the patients compared with the controls, waketime during sleep period (WTSP) ( $37.2 \pm 35.9$ ,  $13.1 \pm 19.4$   $p = 0.012$  respectively) and number of awakeness (NOAW) ( $9.2 \pm 18.2$ ,  $2.6 \pm 3.5$ ,  $p = 0.05$  respectively) were significantly higher, sleep efficiency (SE) ( $84.2 \pm 21.1$ ,  $96.7 \pm 4.6$   $p = 0.009$  respectively) was significantly lower in patients with knee OA. There were significantly positive correlations between MOS sleep scale and PSG (sleep period, sleep onset, REM duration and REM latans) outcomes of the patients ( $r: 0.44-0.59$   $p = 0.04-0.006$ ).

In addition, MOS sleep scale scores of patients were negatively related with both NHP (pain, emotional reaction, sleep and social isolation subgroup scores) and WOMAC (total and functional) scores ( $r: -0.20-0.47$ ,  $p = 0.04-0.0001$ ).

**Conclusions:** The sleep quality of patients with knee OA was worse compared to healthy controls. The poor sleep and sleep quality in knee OA had adversely affected the clinical status and quality of life.

**References:**

- [1] Hays RD, Martin SA, Sesti AM, Spritzer KL. Psychometric properties of the Medical Outcomes Study Sleep measure. *Sleep Med* 2005; 6:41–44.
- [2] Wilcox S, Brenes GA, Levine D, et al. Factors related to sleep disturbance in older adults experiencing knee pain or knee pain with radiographic evidence of knee osteoarthritis. *J Am Geriatr Soc* 2000; 48:1241.
- [3] Leigh TJ, Hindmarch I, Bird HA, Wright V. Comparison of sleep in osteoarthritic patients with age and sex matched healthy controls. *Ann Rheum Dis* 1988;47:40–2.
- [4] Vivien CA, Priscilla SA, Christian G. Sleep and rheumatologic disorders. *Sleep medicine reviews* 2008;12: 211–228.97.
- [5] Stewart AL, Sherbourn C, Hays RD, et al. Summary and discussion of MOS measures. Measuring functioning and well-being: The Medical Outcomes Study approach. Durham: Duke University Press, 1992:345–371.

**Disclosure of Interest:** None declared

**DOI:** 10.1136/annrheumdis-2017-eular.2158

**SAT0533 ASSOCIATION OF OSTEOARTHRITIS AND PERIODONTITIS BASED ON THE KOREA NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY**

M.K. Chung, N. Koo, B.W. Lee, J. Lee, S.-K. Kwok, S.-H. Park, J.H. Ju. *Division of Rheumatology, Department of Internal medicine, Seoul St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Korea, Republic Of*

**Background:** Osteoarthritis (OA) is a chronic joint disease with complex etiologies characterized by synovial inflammation, subchondral bone remodeling, and the formation of osteophytes, which leads to cartilage deterioration. Periodontitis (PD) is also a chronic inflammatory disease characterized by loss of periodontal ligament and alveolar bone. Recently, the association between OA and metabolic diseases has been proposed, and the association between several systemic diseases such as rheumatoid arthritis, metabolic syndrome and periodontitis has been also revealed.

**Objectives:** The aim of this study was to investigate the association between OA and PD in South Korea using data from the Korea National Health and Nutrition Examination Survey (KNHANES) during 2010–2014.

**Methods:** Cross-sectional data of 7,969 adults who completed the KHANES, and participated in both a periodontal examination and a knee imaging were analyzed. OA of knee was defined when a participant had knee arthralgia and showed radiographic change of Kellgren-Lawrence (KL) grade over 1. OA patients were grouped into mild (KL grade 1–2) and severe (KL grade 3–4) OA. The periodontal status was assessed by the Community Periodontal Index. Binary logistic regression analysis was performed according to the OA and PD status, severity of OA, and subgroups (age, gender) adjusting for the socio-demographics, oral health behaviors and status, smoking, and drinking.

**Results:** Of the 7,969 participants, 1408 (17.7%) had OA and 2987 (37.5%) had PD. OA and PD showed no significant association in overall analysis. However, in subgroup analysis, female patients with severe OA were more likely to have PD (adjusted odd ratio (OR) 1.377,  $P = 0.0316$ ); likewise, OR for severe OA in female patient with PD was 1.367. ( $P = 0.054$ )

**Conclusions:** Severe OA and PD were associated with each other especially in