Further work will be done to study the role of the ratio in predicting fracture risk in patients with other conditions.

REFERENCES:

- [1] Williams, GR., & Bassett, JHD. (2018). Thyroid diseases and bone health. *Journal of Endocrinological Investigation*, 41(1), 99-109.
- [2] Saito, J., & Nishikawa, T. (2009). Osteoporosis treatment in patients with hyperthyroidism. *Nishon Rinsho (Japanese journal of clinical medicine)*, 67 (5), 1011-6.
- [3] Tucker, M., (2018, May 18). *Simple Ratio May Predict Fracture Risk in Obese Patients*. Retrieved from <https://www.medscape.com/viewarticle/896882>.

Disclosure of Interests: Khojasta Talash: None declared, Marwan Bukhari Speakers bureau: Bristol-Myers Squib, UCB celltech, Roche/Chugai, Pfizer, Abbvie, Merck, Mennarini, Sanofi-aventis, Eli-Lilly, Janssen and Novartis.
DOI: 10.1136/annrheumdis-2019-eular.1542

Cartilage, synovium and bone

FRI0504 TOCILIZUMAB CONTROLS BONE TURNOVER IN EARLY POLYMYALGIA RHEUMATICA

ALEGRIA Guillermo CARVAJAL¹, Eleonore Bettacchioli², Alain Saraux³, Divi Cornec³, Valerie Devauchelle-Pensec³, Yves Renaudineau⁴. ¹Hospital La Cavale Blanche, Rheumatology, BREST, France; ²Hôpital Morvan CHRU de Brest, Immunologie, BREST, France; ³CHRU Cavale Blanche, Rheumatology CERAINO, Brest, France; ⁴Hôpital Morvan, Immunology, Brest, France

Background: Tocilizumab has been proved to be an alternative to corticosteroids in treating polymyalgia rheumatica. Considering the action on interleukin-6 on bone turnover an effect of tocilizumab is supposed. Few data are available about bone turnover in rheumatoid arthritis patients treated with tocilizumab but no data are available in polymyalgia rheumatica patients.

Objectives: This study explores changes in the bone homeostasis by testing the N-terminal collagen type I extension propeptide (PINP) marker for osteo-formation and the carboxy-terminal region of collagen type I (CTX-I) marker for osteo-resorption in patients taking tocilizumab for polymyalgia rheumatica (PMR).

Methods: Twenty patients were included in the prospective open-label TENOR study (Clinicaltrials.gov NCT01713842) and received three monthly tocilizumab infusions, followed by corticosteroids starting at week (W)12. PINP and CTX-I were tested at inclusion (W0), after tocilizumab but before steroid initiation (W12), at the end of the protocol (W24) and were compared to healthy controls. Information regarding disease activity, inflammatory parameters and interleukin (IL)-6 levels were collected during the follow-up of the patients.

Results: Polymyalgia rheumatica patients were characterized by higher levels of CTX-I relative to healthy controls matched in age and sex at baseline. PINP levels increased at W12 ($p=0.0008$, versus W0) following tocilizumab introduction and CTX-I levels decreased at W24 and after steroid initiation ($p=0.001$, versus W0) (figure 1). Such modifications explain the altered correlation observed between PINP and CTX-I at W0 ($r=0.255$ at W0 versus $r=0.641$ in healthy controls) and its correction after treatment ($r=0.760$ at W12 and $r=0.767$ at W24). Finally, greater changes in PINP were observed in patients whose circulating IL-6 levels decreased after tocilizumab therapy.

Figure 1. Evolution of PINP (A) and CTX-I (B) in polymyalgia rheumatica patients under tocilizumab therapy (W0-W12) and under corticosteroids (W12-W24). Correlation between CTX-I and PINP in polymyalgia rheumatica patients at week 12 (C) and 24 (D)

Conclusion: Control of bone turnover, in part through the inhibition of the IL-6 axis, is observed during tocilizumab and subsequent steroid treatment of polymyalgia rheumatica.

Disclosure of Interests: : Guillermo CARVAJAL ALEGRIA: None declared, Eleonore Bettacchioli: None declared, Alain Saraux Consultant for: Roche SAS, Speakers bureau: Chugai Pharma France, Divi Cornec: None declared, Valerie Devauchelle-Pensec Grant/research support from: Roche-Chugai, Speakers bureau: MSD, BMS, UCB, Roche, Yves Renaudineau: None declared

DOI: 10.1136/annrheumdis-2019-eular.4539

FRI0505 CORRELATIONS BETWEEN CARTILAGE MOLECULAR COMPOSITION DETERMINED BY RAMAN SPECTROSCOPY AND MANKIN SCORE: IMPACT OF INTER AND INTRA-VARIABILITY

Paula Casal-Beiroa¹, Vanesa Balboa-Barreiro², Noa Goyanes¹, Purificación Filgueira-Fernández^{1,3}, Pío González⁴, Sonia Pertega², Francisco J. Blanco¹, Joana Magalhães^{1,3}. ¹Instituto de Investigación Biomédica de A Coruña (INIBIC). CHUAC. SERGAS, Grupo de Investigación en Reumatología (GIR), A Coruña, Spain; ²Instituto de Investigación Biomédica de A Coruña (INIBIC). CHUAC. SERGAS, Unidad de Epidemiología Clínica e Investigación Bioestadística, A Coruña, Spain; ³Centro de Investigación Biomédica en Red (CIBER), Madrid, Spain; ⁴Universidade de Vigo (UVigo), Grupo Nuevos Materiales, Vigo, Spain

Background: Osteoarthritis (OA) is an incurable disease and methods for its early diagnosis are still an unmet clinical need. Raman spectroscopy (RS) presents potential as a diagnosis technique based on the detection of peaks that can be assigned to cartilage components and molecular rearrangements during disease progression.¹ Mankin score (MS) is the main validated method to evaluate severity of cartilage degradation considering structure, cell distribution, Safranin-O staining and tidemark integrity.²

Objectives: To evaluate the correlations between OA cartilage RS assigned peaks and MS, considering the inter- and intra-variability of different observers.

Methods: MS analysis (Subscore-I, structure: 0-6; -II, cellularity: 0-3; and -III, safranin-O staining: 0-4; Total Score: 0-13) of human OA cartilage explants from 22 donors (age range: 32-92, obtained from lesion (n=22) and/or adjacent tissues (n=14), was performed by 3 blinded observers (O1, 2 and 3). Moreover, one of the observers performed the scoring in triplicate, with at least one month between observations. Inter- and intra-observer variability was determined by kappa and intraclass correlation (ICC) coefficients. Raman spectra were obtained with a FT-Raman Bruker RFS100 ($\lambda=1064\text{nm}$) and main peaks assigned (6 ratios related to proteoglycans, collagen, lipid index or calcium phosphate). Spearman's non-parametric correlation coefficient rho was used to compare MS and RS assigned peaks.

Results: Inter-observers variability indicated good (ICC>0.74) or moderate agreement (ICC>0.5) for all scores in lesions, whilst only a good agreement (ICC=0.70) was found for subscore-I, in adjacent tissues, and no agreement for the remaining parameters (subscores -II, -III, and total scoring). However, when performing analysis using kappa coefficients, a simultaneous agreement between the 3 observers was not observed. Intra-observer variability revealed good concordance (ICC>0.6) for all subscores and total scoring in cartilage for both sites, except for subscore -III, in adjacent tissues. In this case, ICC results were confirmed by kappa coefficients. Spearman's correlation coefficient between cartilage main peaks assigned by RS and MS indicated significant differences between observers (Fig.1). Correlations were found for a greater number of MS subscores in O1 (6) regarding O2 (4) or O3 (3) which could be related to the observers' experience (being O1>O2>O3). These correlations were mostly found in lesions (5, 3 and 1 for O1, 2 and 3, respectively) in comparison to adjacent tissues (2, 1 and 2 for O1, 2 and 3, respectively).

Conclusion: Eventhough inter-observation correlations for MS were in the moderate- good range, when analyzing kappa coefficients (categorical variables) these were not maintained. In addition, inter- and intra-observer variability results for adjacent tissues revealed possible limitations when characterizing early to mild OA. In view of MS-RS correlations, a reader dependency is underlined, indicating MS subjectivity and further limitations in the validation of RS using MS.

REFERENCES:

- [1] Esmonde-White, et al. *Analyst* 2011,136(8),1675-1685;
- [2] Mankin, et al. *J. Bone Jt. Surg.* 1971,53,3,523-537.

Acknowledgement: The authors thank Cooperation Program INTERREG V A España - Portugal (POCTEP) 2014-2020 Project: