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**FRI0412** **DOES SEVERE ACUTE POSTOPERATIVE PAIN RESULT IN MORE LONG-TERM PAIN AFTER TOTAL HIP OR KNEE ARTHROPLASTY (THA OR TKA) FOR OSTEOARTHRITIS?**

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**Background:** Chronic pain is a frequently reported unfavourable outcome of total hip and knee arthroplasties (THA/TKA) (7-23% and 10-34%, respectively) in osteoarthritis (OA) patients (1), which is difficult to treat as underlying mechanisms are not fully understood. Acute postoperative pain has been identified as risk factor for development of long-term pain in other surgical procedures, such as mastectomy and thoracotomy (2). However, the effect of acute postoperative pain on development of long-term pain in THA and TKA patients is unknown.

**Objectives:** To investigate if acute pain following THA/TKA in OA patients is associated with long-term pain and if acute pain affects the course of pain up to 1-year postoperatively.

**Methods:** From a longitudinal multicenter study, OA patients scheduled for primary THA or TKA were included. Acute pain scores, using Numeric Rating Scale (NRS), were routinely collected as part of standard care ( $\leq 72$  hours after surgery). In case of  $\geq 2$  NRS scores the two highest scores were averaged ( $n=160$ ), else the single score was taken. Pain was dichotomized into severe ( $NRS \geq 5$ ) and mild ( $NRS < 5$ ). Pain was assessed preoperatively, at 3 (only THA), 6 and 12 months postoperatively using HOOS/KOOS subscale pain. Separate mixed-effect models for THA and TKA patients were used, with dichotomized acute pain as fixed-effect and long-term pain as outcome, while adjusting for confounders (age, sex, BMI, preoperative pain, mental component scale of the SF12 (MCS-12), and duration of the surgery and hospitalization). We included an interaction between time of measurement and acute postoperative pain to analyse whether effect modification was present. Missing values in preoperative pain and MCS-12 were imputed using multiple imputation methods.

**Results:** 81 THA and 87 TKA patients were included, of whom 32.1% and 56.3% reported severe acute pain. The results did not show an association between severe acute pain and long term pain (THA:  $\beta=2.0$ , 95%-CI: -10.9-7.0; TKA:  $\beta=3.8$ , 95%-CI: -10.6-2.9). Furthermore, it seems that there is no effect present of difference in severity of acute pain and the course of pain over time (THA 6-months:  $\beta=6.4$ , 95%-CI: 1.9-10.9 and 12-months:  $\beta=0.2$ , 95%-CI: -4.4-4.8; TKA 12-months:  $\beta=3.2$ , 95%-CI: -0.5-6.8).

**Conclusion:** We did not find an association between acute pain and the development of long-term pain nor that severity of acute pain affects the course of postoperative pain in THA and TKA patients. The fact that THA and TKA patients often experience chronic preoperative pain might be a possible explanation for this finding. Nonetheless, future studies including additional measures of acute pain and pain sensitization in patients with chronic preoperative pain are necessary to draw stronger conclusions.

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**FRI0413** **THE ASSOCIATION OF OBESITY WITH OSTEOARTHRITIS IS LIMITEDLY MEDIATED BY HYPERTENSION AND SUBCLINICAL ATHEROSCLEROSIS**

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**Background:** Obesity-related metabolic dysregulation may lead to atherosclerotic vascular changes. It has been hypothesized that a compromised blood flow may cause detrimental changes to the subchondral bone and decrease nutrient supply to the cartilage. To which extent atherosclerosis may explain the association between obesity and OA has not been investigated.

**Objectives:** To investigate the role of hypertension and subclinical atherosclerosis (carotid intima-media thickness (IMT), popliteal vessel wall thickness (VWT), aortic pulse wave velocity (PWV)) as mediators of the association of obesity with hand and knee OA.

**Methods:** We used cross-sectional data from the population-based NEO study, excluding participants with concomitant rheumatic diseases ( $n = 323$ ), resulting in 6,334 participants. Clinical hand and knee OA were defined by the ACR classification criteria. Popliteal VWT was assessed on MR images in a subpopulation ( $n = 1,095$ ), using VesselMASS for semi-automated detection of the vessel wall boundaries. Aortic PWV was estimated on abdominal velocity-encoded MR images in a subpopulation ( $n = 2,580$ ). Carotid IMT was assessed by ultrasonography. Hypertension was defined as a systolic blood pressure  $\geq 130$  mmHg or a diastolic blood pressure  $\geq 85$  mmHg, or using antihypertensive medication. Continuous variables were standardized (mean 0, standard deviation 1). Associations between BMI and OA were assessed with logistic regression analyses, adjusted for age, sex and education. Subsequently, possible mediators were added to the model and the percentage mediation was calculated.

**Results:** The population consisted of 55% women, with a mean (SD) age of 56 (6) years and BMI of 26 (4) kg/m<sup>2</sup>. Hand OA was present in 8% and knee OA in 10% of participants. Hypertension was present in 61.6% of participants. Mean (SD) carotid IMT was 0.62 (0.09) mm, popliteal VWT was 0.53 (0.05) mm, and aortic PWV was 6.56 (1.30) m/s. BMI was associated with the presence of hand OA and knee OA (table 1). BMI was positively associated with hypertension and carotid IMT, but not with popliteal VWT and aortic PWV. The association between BMI and hand OA was partially mediated by hypertension (5.9%) and carotid IMT (10.6%). Hypertension (4.9%) showed a weak mediating effect for the association between BMI and knee OA.

**Table 1. Mediation of the association of BMI with OA by hypertension and atherosclerosis**

	Hand OA OR (95% CI)	Mediator OR/ $\beta$ (95% CI)	Hand OA OR (95% CI)	Mediation % (95% CI)
BMI	1.21 (1.08; 1.36)	1.72 (1.56; 1.90)	1.20 (1.06; 1.36)	5.9 (3.4; 17.4)
Hypertension			1.15 (0.82; 1.60)	
BMI	1.21 (1.08; 1.36)	0.23 (0.19; 0.27)	1.19 (1.05; 1.34)	10.6 (6.2; 30.5)
Carotid IMT			1.09 (0.94; 1.25)	
BMI	1.56 (1.17; 2.08)	0.01 (-0.06; 0.09)	1.55 (1.16; 2.07)	0.5 (0.3; 1.7)
Popliteal VWT			1.14 (0.84; 1.55)	
BMI	1.41 (1.15; 1.73)	0.05 (-0.01; 0.11)	1.41 (1.15; 1.73)	0.7 (0.4; 2.0)
Aorta PWV			1.04 (0.81; 1.33)	
	Knee OA OR (95% CI)	Mediator OR/ $\beta$ (95% CI)	Knee OA OR (95% CI)	
BMI	1.46 (1.32; 1.62)	1.70 (1.55; 1.87)	1.43 (1.29; 1.59)	4.9 (3.7; 7.0)
Hypertension			1.25 (0.93; 1.67)	
BMI	1.46 (1.32; 1.62)	0.24 (0.20; 0.27)	1.47 (1.33; 1.62)	-1.6 (-2.4; -1.2)
Carotid IMT			0.97 (0.86; 1.09)	
BMI	1.20 (0.88; 1.64)	0.03 (-0.04; 0.11)	1.21 (0.89; 1.64)	-0.5 (-7.4; 13.3)
Popliteal VWT			0.95 (0.74; 1.24)	
BMI	1.37 (1.12; 1.67)	0.05 (-0.00; 0.11)	1.37 (1.12; 1.67)	-0.5 (-1.8; -0.3)
Aorta PWV			0.96 (0.76; 1.21)	

Results are based on analyses weighted towards the BMI distribution of the general population ( $n = 6,334$ ). Analysis regarding popliteal VWT ( $n = 1,095$ ) and aorta PWV ( $n = 2,580$ ) were assessed in a subpopulation. Continuous variables were standardized (mean 0, SD 1), SD BMI = 4.41, SD carotid IMT = 0.09, SD popliteal VWT = 0.05, SD aorta PWV = 1.30.

**Conclusion:** We assessed whether the association between BMI and OA was mediated by hypertension and atherosclerosis. Our results imply that either such mediation is absent or trivial, or that the atherosclerosis measures were too weak.

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**FRI0414** **FACTORS ASSOCIATED WITH THE IMPACT OF GONARTHROSIS ON MUSLIM PRAYER**

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**Background:** Gonarthrosis is a frequent and chronic pathology, which can cause painful functional impotence and limit the performance of activities of daily living [1].

**Objectives:** This study aimed to assess the patient's perception of the physical and psychological repercussions of his illness on the practice of prayer and to determine the factors associated with this repercussion.

**Methods:** It was a cross-sectional prospective study conducted in the rheumatology department in 56 patients with gonarthrosis who regularly practiced prayer before the onset of the disease. The socio-demographic data, the clinical characteristics of gonarthrosis were studied and a pre-established questionnaire was offered to patients to assess the physical and psychological impact of gonarthrosis on their prayer practice.

**Results:** Fifty-six patients were included, 83.3% of whom were female. The average age was 56.1 years [38-78 years]. The disease has progressed for an average of 6.14 years [1-13 years]. Gonarthrosis was bilateral in 80.4% of cases. The average body mass index (BMI) was 30.29 kg / m<sup>2</sup> ± 3.061 with extremes ranging from 24 to 36 kg / m<sup>2</sup>. Quadriceps (Q) retraction was noted in 64.28% of cases. Gonarthrosis was classified as stages I, II and III according to the classification of Kellegren and Lawrence in 14.3%, 57.1% and 28.6% of patients respectively.

In 71.4% of cases (40 patients), the practice of prayer after the onset of gonarthrosis was considered more difficult with a degree of difficulty of 4.23/10 ± 2. Initial standing was considered possible by all patients. Inclination was possible in 89.2% of patients, whereas it was replaced by sitting on a chair by the rest. Prostration and final sitting station were considered impossible by 64.3% of patients and were therefore performed on chairs (36 patients). The limiting factor cited by patients was pain in 100% of cases. A psychological impact was reported in 53.6% of cases. It was explained by the feeling of guilt in 22 cases, the relatives' comments in 8 cases and the suffering related to disability in 7 cases.

Prayer position was associated with Q retraction ( $p = 0.001$ ) and knee pain seniority ( $6.81 \pm 3.608$  vs  $4.95 \pm 3.017$ ,  $p = 0.05$ ). The degree of difficulty was associated with the BMI ( $p = 0.013$ ), knee pain seniority ( $p < 0.001$ ) and Q retraction ( $5.74 \pm 1.851$  vs  $3.46 \pm 1.789$ ,  $p < 0.001$ ).

**Conclusion:** Prayer is an activity that is part of the daily lives of many Muslim patients, its evaluation should be considered as one of the elements of the quality of life and functional impact of gonarthrosis.

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**FRI0415** **BODY MASS INDEX AND STATIC FOOT DISORDERS IN GONARTHROSIC PATIENTS**

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**Background:** Several studies have shown that there is a link between body mass index (BMI) and painful foot imputed to a biomechanical change in foot structure [1].

**Objectives:** Our objective was to study the association between BMI and static foot disorders in gonarthrosic subjects.

**Methods:** It was a prospective descriptive study conducted in the rheumatology department of the Mohamed Kassab Institute of Orthopedics with 60 patients with Gonarthrosis. The socio-demographic data of the patients were studied. BMI was calculated for all patients. Static foot disorders have been studied.

**Results:** Sixty patients were included, 83.3% of whom were female. The average age was 55.2 years [38-78 years]. The disease has been evolving for an average of 6 years [1-13 years]. The lesion was bilateral in 80% of cases, the average

body mass index was 30.4 kg / m<sup>2</sup> [24-36]. Knee arthritis was classified as stage I, II and III according to the Kellegren and Lawrence classification in 18.5%, 55.6% and 25.9% of patients respectively. The foot examination involved 108 gonarthrosic limbs. Examination of the integuments showed hyperkeratosis in 94.4% of the cases (79.6% calluses and 83.3% callosities). Forefoot deformities were Hallux valgus (HV) in 52.8% of cases and overlapping toes in 18.5% of cases. Pronation deformity using the Foot Posture Index (FPI) was found in 51.9% of cases. Abnormal lowering of navicular bone was noted in 51.9%. The podoscopic impression revealed flat feet in 73.2% of the cases.

A statistically significant association was found between BMI and the presence of calluses ( $31.21 \pm 2.897$  vs  $26.83 \pm 1.425$ ,  $p < 0.001$ ), with HV ( $31.37 \pm 3.086$  vs  $29.49 \pm 2.969$ ,  $p = 0.002$ ), at the overlap of the toes ( $33.2 \pm 1.361$  vs  $29.86 \pm 1.130$ ,  $p < 0.001$ ), with the lowering of the navicular bone ( $31.17 \pm 2.885$  vs  $29.68 \pm 3.304$ ,  $p = 0.015$ ), FPI ( $p = 0.003$ ) and flat podoscopic impression ( $p < 0.001$ ).

**Conclusion:** BMI is strongly associated with static feet disorders in gonarthrosic patients by aggravating the postural changes in the foot caused by knee osteoarthritis [2]. Obesity is associated mainly with the existence of flat feet, pronation of the foot, toes deformities and hyperkeratosis.

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**FRI0416** **COMBINATION OF SERUM ADIPOKINES/RELATED INFLAMMATORY FACTORS AND RATIOS AS PREDICTORS OF INFRAPATELLAR FAT PAD VOLUME IN KNEE OSTEOARTHRITIS PATIENTS: USAGE OF A COMPREHENSIVE MACHINE LEARNING APPROACH**

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**Background:** One of the hurdles in osteoarthritis (OA) drug discovery and the improvement of therapeutic approaches is the early identification of patients who will progress. It is therefore crucial to find efficient and reliable means of screening OA progressors. Although the main risk factors, age, gender and body mass index (BMI), are important, they alone are poor predictors. However, serum factors could be potential biomarkers for early prediction of knee OA progression.

**Objectives:** In a first step toward finding early reliable predictors of OA progressors, this study aimed to determine, in OA individuals, the optimum combination of serum levels of adipokines/related inflammatory factors, their ratios, and the three main OA risk factors for predicting knee OA infrapatellar fat pad (IPFP) volume, as this tissue has been associated with knee OA onset and progression.

**Methods:** Serum and magnetic resonance images (MRI) were from the Osteoarthritis Initiative at baseline. Variables (48) comprised the 3 main OA risk factors (age, gender, BMI), 6 adipokines, 3 inflammatory factors, and their 36 ratios. IPFP volume was assessed on MRI with a neural network methodology. The best variables and models were identified in Total cohort (n=678), High-BMI (n=341) and Low-BMI (n=337), using an artificial intelligence selection approach: the adaptive neuro-fuzzy inference system embedded with fuzzy c-means clustering (ANFIS-FCM). Performance was validated using uncertainty analyses and statistical indices. Reproducibility was done using 80 OA patients from a clinical trial (female, n=57; male, n=23).

**Results:** For the three groups, 8.44E+14 sub-variables were investigated and 48 models were selected. The best model for each group included five variables: the three risk factors and adipin/C-reactive protein combined for Total cohort, adipin/chemerin; High-BMI, chemerin/adiponectin high molecular weight; and Low-BMI, interleukin-8. Data also revealed that the main form of the ratio used for the model was justified, as the use of the inverse form slightly decreased the performance of the model in both training and testing stages. Further investigation indicated that gender improved (13-16%) the prediction results compared to the BMI-based models. For each gender, we then generated a pseudocode (an evolutionary computation equation) with the 5 variables for predicting IPFP volume. Reproducibility experiments were excellent (correlation coefficient: female 0.83, male 0.95).