Results: Knee OA progression (from radiographic stage II to stage III) within 1 year follow up was documented in 15 patients (Group 2 – with progressed OA), while 170 patients did not show any progression (Group 1 – no progression). Both groups were comparable in terms of age, age at RA onset, and duration of the disease. Although patients who progressed had higher body weight (97.1 ± 14.0 vs 74.2 ± 10.8 kg, $p < 0.0001$) and BMI (31.9 ± 5.8 vs 27.3 ± 4.1 kg/m², $p < 0.0001$). Patients from Group II had more intense knee pain during walking (VAS – 65.8 ± 11.8 vs 47.5 ± 18.7 mm, $p < 0.0003$), and higher WOMAC: pain- 330.5 ± 66.0 vs 237.8 ± 85.4 mm, $p < 0.0001$; function – 1044 ± 190.4 vs 859.8 ± 243.8 mm, $p < 0.007$. Patients from Group II showed higher rates of varus knee alignment (66.7% vs 35.3%, $RR=1.89$, 95% CI 1.25–2.85, $p=0.02$) and H.valgus (86.7% vs 61.8%, $RR=1.4$, 95% CI 1.11–1.77, $p=0.04$), as well as higher rates of arterial hypertension (93.3% vs 71.8%, respectively, $RR=1.3$, 95% CI 1.1–1.53, $p=0.05$) and type 2 diabetes mellitus (DM) (33.3% vs 12.9%, $RR=2.57$, 95% CI 1.14–5.82, $p=0.04$). MRI showed higher percentage of medial and lateral tibia cartilage defects in Group 2 patients (57.2% vs 18.6%, respectively; $RR=3.06$, 95% CI 1.74–5.38, $p < 0.003$; 57.2% vs 14%, $RR=4.08$, 95% CI 2.23–7.46 $p < 0.0006$); bone marrow edema (BME) in medial (71.4% vs 12.2%, $RR=5.83$, 95% CI 3.38–10.1, $p < 0.000004$) and lateral tibial compartments (21.4% vs 4.1%, $RR=5.25$, 95% CI 1.47–18.7, $p=0.03$); subchondral cysts, occupying more than 25% of the area in medial and lateral tibial compartments (respectively, 28.6% vs 7.4%, $RR=3.84$, 95% CI 1.4–10.5, $p < 0.03$; and 35.7% vs 8.8%, $RR=4.06$, 95% CI 1.7–9.7, $p=0.01$). Synovitis (MRI findings) was documented in 100% patients from Group 2 and in 58.4% patients without OA progression ($RR=1.71$, 95% CI 1.5–2.0, $p=0.002$). A multivariate (discriminant) analysis showed that the most important risk factors for knee OA progression were: higher body weight, high WOMAC pain score, presence of type 2 DM, BME in medial tibial compartment, and cartilage damage in medial tibial compartment (MRI findings). A model capable of predicting rapid progression of knee OA in an individual patient with high accuracy (area under the ROC-curve 0.925 (95% CI 0.828–1.022)) has been developed based on identified RF and their coefficients.

Abstract THU0459 – Figure 1

Conclusion: In a prospective multicenter study, using comprehensive instrumental examination the following key predictors of rapid knee OA progression were identified: excessive body weight, high WOMAC pain score, presence of type 2 DM, BME in medial tibial compartment, and cartilage damage in medial tibial compartment (MRI findings).

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THU0460

IDENTIFICATION OF POSTOPERATIVE PAIN BIOMARKERS USING GENE EXPRESSION ANALYSES IN THE PERIPHERAL BLOOD OF OSTEOARTHRITIC PATIENTS PRIOR TO JOINT REPLACEMENT

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Background: Osteoarthritis (OA) is a chronic rheumatic disease, which involves pain, limited inflammation and local destruction of the knee joint.

OA pain is a major clinical symptom, which limits working capacity and denotes an important indication for joint replacement in the end-stage OA. In spite of significant number of positive outcomes, chronic postoperative pain represents a major adverse consequence of surgery, which is observed in 10-40% of OA patients. Therefore, identification of patients potentially capable of developing chronic postoperative pain prior to surgery could significantly improve therapy outcome. Central sensitization is in charge of pain symptoms in about 30% of end-stage OA patients. Several recently identified molecular markers such as cytokines, chemokines, calcium and glutamate transporters, caspases, and proteases has been shown to be responsible for central sensitization. Therefore, we hypothesized that genes related to pain sensitization whose expression is upregulated in about 30% of the examined end-stage OA patient cohort might be responsible for postoperative pain.

Objectives: To outline an approach for search of biomarkers related to chronic postoperative pain development before joint replacement in the peripheral blood of end-stage OA patients.

Methods: We examined peripheral blood of 26 healthy volunteers (average age 55 ± 8.3 years old) and 53 end-stage OA patients (average age 56.5 ± 8.9 years old) undergoing joint replacement surgery. MMP-9, TIMP1, TGFβ1, and caspase 3 protein levels were quantified by ELISA. Total RNA isolated from whole blood was used in expression studies for the genes related to central sensitization such as mechanistic target of rapamycin, mTOR; caspase 3; metalloproteinase (MMP)-9; tissue inhibitor of metalloproteinase TIMP1; cathepsins K and S; interleukin (IL)-1β; cyclooxygenase (COX)2; tumor necrosis factor (TNF)α, and transforming growth (TGF)β1. These were performed with quantitative real-time RT-PCR.

Results: Retrospective analysis of gene expression in the peripheral blood of end-stage OA patients before joint replacement surgery revealed that gene expression data for TNFα, IL-1β, COX2, TGFβ1, and mTOR were not applicable as these gene expressions were significantly higher compared to healthy controls in all the examined OA patients. High expression of pain associated cathepsin S in 17% of the examined OA patients and cathepsin K, in 21% might indicate the possibility of postoperative pain development in these OA patients. In contrast, low expression of caspase 3 in 43% of the examined OA patients and MMP-9, in 23%, might point toward the absence of postoperative pain in these subjects.

Conclusion: Gene expression analysis in the peripheral blood of the end-stage OA patients measured before joint replacement surgery might represent an approach for prediction of postoperative pain development.

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THU0461

IDENTIFICATION OF DEFINITIONS OF POOR OUTCOME AFTER TREATMENT OF KNEE OSTEOARTHRITIS: A LITERATURE REVIEW

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Background: Total knee replacement (TKR) is considered an effective intervention of the treatment of advanced knee osteoarthritis (OA) (Kellgren & Lawrence >2). However, a significant proportion of patients could be considered as a poor-responder to TKR (i.e. no or little improvement) in terms of chronic knee pain, functional disability, poor quality of life (QoL), and dissatisfaction after TKR. Both in research and in clinical practice it is challenging to identify those patients with an unfavourable course after TKR. It is difficult though to quantify the proportion of patients with poor response to TKR, as different definitions of, and perspectives (clinician's and patient's) on failure are being used.

Objectives: The aim of this study was to review the literature and summarize definitions of poor response to TKR.

Methods: A systematic search up to 2016 was performed to identify and review previously used definitions of poor response to primary TKR in the literature. Studies were included if dichotomous definitions of outcome after primary TKR were used, if a prospective design was used and in English full text available. The type, amount and combination of domains (i.e. pain and physical function), outcome measures, type of responses (absolute/relative, change/cut-off), values and moments of follow-up used in definitions were summarized.

Results: A total of 44 different dichotomous definitions of poor response to TKR, were extracted from 1849 initially identified studies. 34 definitions incorporated one domain, six definitions comprised two domains and four definitions comprised three domains. Eight different domains were used in identified definitions: pain, physical function (mobility), physical functioning