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THU0424 THE NEW TREATMENT APPROACH IN KNEE OSTEOARTHRITIS: EFFICACY OF CELLULAR MATRIX COMBINATION OF PLATELET RICH PLASMA WITH HYALURONIC ACID VERSUS TWO DIFFERENT TYPES OF HYALURONIC ACID (HA) (PROSPECTIVE, RANDOMIZED, DOUBLE BLIND CONTROL STUDY)

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Background: Osteoarthritis pathogenesis is a complex process associated with decreased ability to regenerate cartilage mainly due to lack of physiological vascularization. One of the most commonly affected joints is the knee.
Objectives: The aim of this study was to compare the efficacy of intra-articular (IA) injections of platelet rich plasma (PRP) combined with hyaluronic acid (HA) prepared with the Cellular Matrix device *versus* IA injections with two different types of hyaluronic acid for treatment of knee osteoarthritis.
Methods: This is a prospective, randomized, double-blind, controlled study on 53 patients (90 knees) suffering from knee osteoarthritis, divided in 3 groups. The first group comprised 19 patients (30 knees) treated with 3 IA injections, one every second week, of Cellular Matrix (CM) PRP-HA combination. The second group of 19 patients (30 knees) was treated with 3 weekly IA injections of 2% non-cross-linked sodium hyaluronate and the third group of 15 patients (30 knees) treated with 3 weekly IA injections of 2% non-cross-linked sodium hyaluronate with mannitol. All groups were homogeneous concerning gender, age and Kellgren Lawrence scale (I to III). For all patients visual analog pain scale (VAS), Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), Knee Injury and Osteoarthritis Outcome Score (KOOS), The International Knee Documentation Committee (IKDC) score ("well-being" scale for all 4 scores between 0 and 100) and ultrasound (US) cartilage thickness on lateral, trochlear, and medial compartments, with normal range values from 2 to 2.5 mm, were measured at the beginning of the treatment (baseline) and at each follow up visit, that is at 2, 6 and 12 months after the last injection.
Results: A statistically significant difference ($p < 0.05$) in the CM group was found compared to AV and OP group in the values of VAS, WOMAC, KOOS and IKDC after two months, although an improvement, compared to baseline values, was observed for the indicated parameters in all groups. A high statistically significant difference ($p < 0.01$) was obtained in the CM group compared to the AV and OP group for VAS, WOMAC, KOOS and IKDC after 6 and 12 months. In both groups of patients treated with hyaluronic acid, a deterioration of values for VAS, WOMAC, KOOS and IKDC score was seen at 12 months in relation to values at 6 months. The CM treated group showed statistically significant improvement ($p < 0.05$) of the cartilage thickness after 2, 6 and 12 months in the medial and highly statistically significant improvement ($p<0.01$) in the lateral segments of knee cartilage in comparison to baseline values.
Conclusion: The Cellular Matrix PRP-HA combination might be one of the most potent, safe, fast and novel therapeutic option for osteoarthritis of the knee, as well as a useful tool for postponing arthroplasty surgery when it is necessary.

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THU0425 COST-EFFECTIVE OA TRIALS REQUIRE ENROLMENT OF KNEES WITH DEFINITE JOINT SPACE NARROWING (KELLGREN LAWRENCE 3); DATA FROM 6,939 KNEES FROM THE OSTEOARTHRITIS INITIATIVE

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Background: The design of clinical trials for osteoarthritis is challenging; structural changes in tissues are quantitatively small and proceed very slowly. No clear guidance exists on how to optimise recruitment. We have previously shown that the use of radiographic joint space width of 2 to 4.5 mm is of major importance for improving responsiveness in clinical trials using MRI bone and cartilage outcomes. However, it can be technically challenging to screen for joint space width this carefully, so we considered whether Kellgren-Lawrence (KL) grade could be used as an enrichment strategy. As no other commonly used covariates have been shown to reliably increase responsiveness, it would be useful to know the numbers needed using ONLY an expert-read KL grade structural inclusion criterion.
Objectives: To determine responsiveness of change in femur bone shape and cartilage thickness using a large observational dataset and calculate likely trial cohort sizes per arm for each KL grade.
Methods: We used all knees from the Osteoarthritis Initiative which had MR images at baseline, 1 and 2 years, and a baseline KL grade (centrally read and adjudicated by 2 experienced radiologists). Quantitative 3D femur bone shape, and cartilage thickness in the central medial femoral region were used as outcome measures. Responsiveness was assessed using standardised response means "SRM" (CIs were assessed using the bootstrap method of Efron) and derived the number of patients per arm in a putative trial to demonstrate 50% change, at 80% probability, α=0.05.
Results: 6,945 knees (3,667 subjects, 2,085 female) were included (KL 0: 2,798; KL1: 1,338 knees; KL2: 1,879 knees; KL3: 924 knees). Table 1 provides summary results and Figure 1 shows SRM and putative trial cohort numbers by KL grade for bone shape and cartilage thickness. Femur bone shape had higher SRM values at all timepoints, typically twice that of SRM for cartilage thickness in all KL groups. Cohort size when using cartilage thickness increased significantly between KL2 and KL3.
Conclusion: Expert-read KL3 inclusion, using 2 independent radiologists, with strict attention to standards provides increased responsiveness for common MRI OA outcomes. It is worth noting that 80% of KL3 knees have OARSI JSN grade 3, and 78% of KL3 knees have radiographic JSW of 2 to 4.5 mm, and similar enrichment can be expected using these alternatives. Few clinical studies can afford cohort sizes of greater than 200 knees, and for these studies, using a large proportion of KL3 knees is critical, especially if cartilage thickness is to be used as the outcome.