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Title: Comparison of synovial fluid parameters after total knee replacement between cobalt-chrome/polyethylene and oxinium/polyethylene bearings. A prospective, randomized study.

Abstract: Introduction: Morphological changes observed in OA include cartilage erosion as well as a variable degree of synovial inflammation. Several cytokines have been determined to be implicated in these changes such as interleukine IL-1beta, TNF-alfa, IL-6. Little has been written about their behaviour after a total knee replacement (TKR) had been performed.

Objective: To determine the behaviour of the synovial fluid parameters (IL-1beta, TNF-alfa and IL-6) after a TKR and to determine whether there are differences between two different bearings: Oxinium/polyethylene and Cobalt-Chrome/Polyethylene.

Methods: A prospective, randomized study was performed to evaluate the outcomes in thirty-two patients who had undergone sequential bilateral primary total knee replacement (TKR). An Oxinium femoral component was used in one knee, and a cobalt-chromium one was used in the other. 11 patients were excluded for the follow-up due to different adverse events: 2 acute infections, 2 instabilities, 2 stiffnesses, 1 severe health problems, 2 insatisfactions after the first TKR and 2 patients who were satisfied with their knee and didn't want the contralateral TKR. The total number of patients for the final assessment was 23 (46 TKR). There were 8 men and 15 women; the mean age at the time of surgery was 65.3 years. The mean duration of follow-up was 1 year. Clinical, radiographic and synovial parameters evaluations were performed preoperatively and at six and twelve months after surgery. Two Scores were used for the clinical assessment: (KSS) for knee and function and WOMAC Score. The radiographic evaluation included the alignment of the components, signs of loosening or other complication. The synovial fluid parameters were evaluated with Elisa.

Results: We found a significant decrease in TNF-alfa and IL-1beta values after the surgery in both groups. No differences were found in clinical, radiographic and synovial fluid parameters between the two groups. We found a correlation between the TNF-alfa decrease after surgery and the improvement of WOMAC Score in both groups.

Conclusion: Cytokines like TNF-alfa and IL-1beta are implicated in joint deterioration in osteoarthritis, their values diminishing after TKR, with consequent clinical improvement. Both bearings determine a similar biological response in the joint after TKR.