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Intra-articular metallic gold micro particles relieve pain and enhance function in patients with knee osteoarthritis

A pilot study

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Aim of Investigations

Many patients suffering from osteoarthritis (OA) do not get adequate pain relief. Current therapies relieve pain to some extent and up to 30 % having an arthroplasty do not achieve sufficient improvement.

Animal studies indicate gold ions have a long-acting effect on OA pain. The immune-modulatory effect of gold ions have for more than 50 years a known anti-inflammatory effect in the treatment of rheumatic arthritis. Gold ions alter the function of macrophages by inhibiting lysosomal enzymes and lowering production of pro-inflammatory cytokines(1-3).

Dissociocytic metallic gold (DMG) ions have an immune-suppressive effect in laboratory testing(4-12) (Figure 1-3). Animal studies prove the effect of gold implantation in arthritic joints(13-14). Injection of DMG in animal models stimulate the immune system(15,16). The carrier for injecting the DMG micro particles is hyaluronic acid (12-13).

No studies have investigated the effect of intraarticular gold micro particle implants for treatment of knee osteoarthritis in humans. The present open, pilot study aimed to investigate if gold ions have a role in treating knee osteoarthritis(17).

Methods

A cohort of 30 patients referred for treatment of knee OA, aged 21-75 years, mean 63 (46-100) year, BMI 28.8 (22.8-41.7), 18 were men 12 women. Many patients suffering from osteoarthritis (OA) do not have for more than 50 years a known anti-inflammatory effect in the treatment of rheumatic arthritis. Gold ions alter the function of macrophages by inhibiting lysosomal enzymes and lowering production of pro-inflammatory cytokines(1-3).

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Pain pressure thresholds increased from 9 (6-16) to 3 (0-19), stiffness from 4 (1-8) to 2 (0-8), function from 29 (14-51) to 11 (4-41) (Figure 4). PainDetect decreased from 10 (1-26) to 3 (0-19) (Figure 5). Pain pressure thresholds increased (anti-hyperalgesia) from 598 kPa (276-1043) to 616 kPa (349-1089) (Figure 6). All differences, P < 0.05 (Wilcoxon sign test).

Results

Pain and function improved in 25 of 30 patients. Womac pain decreased from 9 (6-16) to 3 (0-19), stiffness from 4 (1-8) to 2 (0-8), function from 29 (14-51) to 11 (4-41) (Figure 4). PainDetect decreased from 10 (1-26) to 3 (0-19) (Figure 5). Pain pressure thresholds increased (anti-hyperalgesia) from 598 kPa (276-1043) to 616 kPa (349-1089) (Figure 6). All differences, P < 0.05 (Wilcoxon sign test).

Conclusions

Intra-articular metallic gold improved joint pain, stiffness and function. The increased pressure pain threshold indicate less joint hyperalgesia. Intra articular gold particles may modify the synovial inflammation as a part of the sensitization in knee OA patients. This cohort of patients with moderate to severe knee osteoarthritis and synovial effusion intra-articular metallic gold relieved pain and enhanced function in more than 80 % of the patients. This study suggests a basis for a future placebo controlled randomized trial in OA patients.

References

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