Clinical Sheet

EFFICACY OF HYDROLYZED COLLAGEN IN THE INFILTRATIVE TREATMENT OF KNEE OSTEOARTHROSIS

Hydrolyzed collagen has been shown to be effective in the reduction of pain and functional recovery of class 2-3 Osteoarthrosis.

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Osteoarthrosis (OA) is an inflammatory joint disease that affects more than 340 million people worldwide[1]. The most commonly affected sites are the knee and hip, as these joints are subjected to the greatest functional load. Knee Osteoarthrosis in particular, has seen an increase in prevalence of about 30% in the period 2007-2017 (source: GBD 2017[2]). Associated with the condition is pain, swelling, and reduced joint function. Although there is no cure for OA, scientific research over the past 20 years has allowed for a better understanding of its causes. In particular, it has been highlighted the fundamental role of metalloproteases (MMP-1, MMP-3. MMP-13) that degrade collagen type II (the major constituent of cartilage), thus destabilizing the entire associated joint matrix (proteoglycans and hyaluronic acid) and determining the degradation of cartilage. The treatments currently used (corticosteroids, PRP, hyaluronic acid) show a considerable variability in clinical effectiveness[3] and can also cause serious side effects in the case of corticosteroids[4]. Recently it has been described in the literature the use of a new infiltrative device based on hydrolyzed collagen that acts in the strengthening of connective tissues and consequently promotes functional recovery and reduction of pain symptoms.

1. Cieza, A., et al, https://doi.org/10.1016/S0140-6736(20)32340-0 (2021).
2. Disease, G.B.D., I. , https://doi.org/10.1016/S0140-6736(18)32279-7 (2018).
3. Ayub, S., et al. https://doi.org/10.1093/rheumatology/keaa808 (2021).
4. Wijn, S.R.W., et al. https://doi.org/10.1302/0301-620X.102B5.BJJ-2019-1376.R1 (2020)

Materials

Treatment was performed with CHondroGrid (Bioteck): an injectable medical device composed of freeze-dried hydrolyzed collagen (collagen peptides weighing < 3.3 kDa).
CHondroGrid is indicated for the reduction of pain symptoms and the functional recovery of joints and muscular-tendinous-ligamentous structures, whether they are caused by degenerative diseases or due to trauma or overload.
Before use, the device should be dissolved in 2 ml of water for injections. The protocol of intra-articular use of CHondroGrid provides a cycle of three injections: the second at a distance of 15 days from the first and the third at 30 days from the previous. The mechanism of action is based on the ability of hydrolyzed collagen to diffuse in the synovial fluid and distribute evenly over the surface of the damaged joint, strengthening the cartilage matrix. CHondroGrid is in fact able to perform a mechanical action of direct reinforcement of the weakened and/or deteriorated structures, improving mobility and helping to reduce the pain symptoms at the expense of the joint.

Age (years)	57±13.3
Weight (Kg)	78.25±5.6
Height (cm)	1.68±0.1
BMI(Kg/m2)	27.6±1.1
KL score	2.4±0.5
Diabetes	0/5
Cardiovascular Diseases	1/5
Metabolic diseases	0/5
Concomitant treatments	0/5

Fig. 1 *– Demographics of patients treated with CHondroGrid.*

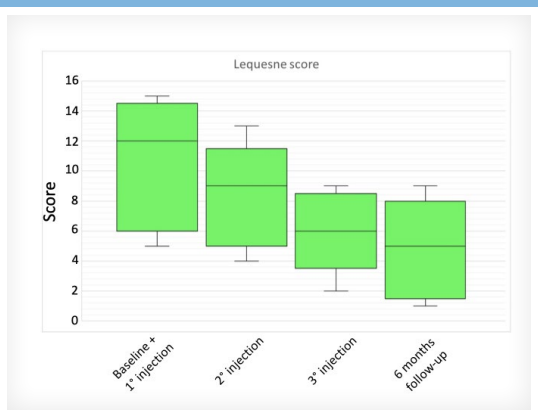

Fig. 2 *– BOX Plot of the Lesquesne score. At the last follow-up, there was an improvement of approximately 55% from baseline.*

Fig. 3 *– ChondroGrid® contains 4 mg of freeze-dried low molecular weight (< 3.3 kDa) collagen peptides in a sterile double pack.*

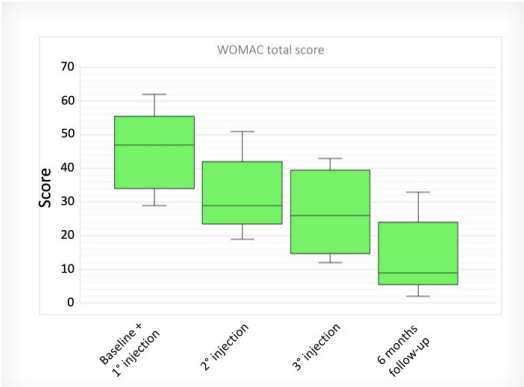

Fig. 4 *– Plot of the WOMAC relative to the overall situation (pain + stiffness + physical function). At the last follow-up there is a functional recovery of about 70% compared to the initial situation.*

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Results

Patients included in this case series were affected by gonarthrosis with 2 and 3 grades of the Kellgren-Lawrence scale and were treated with 3 intra-articular injections of CHondroGrid. Each patient completed a questionnaire to record Lequesne's algofunctional index, WOMAC scores, subjective VAS values measured both at rest and in motion, at baseline, after each injection, and at 6 months after the third injection (follow-up). Each score was represented with a box plot, a graph showing the statistical distribution of the values obtained[5]. The results show how the treatment with CHondroGrid reduces pain and promotes functional recovery in treated patients. In particular, the VAS scores collected in movement and at rest, show a reduction in pain of 65% and 69%, respectively. The curves of the VAS graphs suggest that the improvement is constantly progressing even beyond 6 months after the last injection. It is interesting to observe that the decrease in VAS values is significant already after each injection. Similarly, the Lequesne index shows a reduction in pain of about 55%. WOMAC evaluations confirm the reduction in pain (72%) and stiffness (71%). In addition, the WOMAC assessment shows progressive functional recovery (69%). The total WOMAC score, which is calculated by including all variables (pain, stiffness, and functional recovery) shows an overall improvement in the patient's condition of approximately 70%. No side effects of any kind were observed in the treated patients. It is interesting to note that even for the WOMAC and Lequesne scores, the effect of treatment with CHondroGrid is maintained even at the follow-up of 6 months after the last injection.

This case series confirms the excellent efficacy and safety results of CHondroGrid observed in previously published clinical studies[6,7] .

5. Krzywinski, M. et al. , https://doi.org/10.1038/nmeth.2813 (2014).

6. De Luca, P., et al. , https://doi.org/10.3390/jcm8070975 (2019).

7. Volpi, P., et al. , https://doi.org/10.1007/s00264-020-04616-8 (2020).

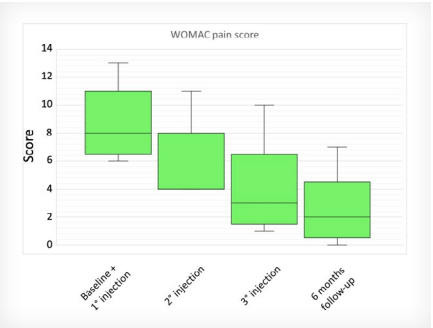

Fig. 5 *– BOX Plot of WOMAC related to pain. At the last follow-up, there was a decrease in pain of approximately 72% from baseline.*

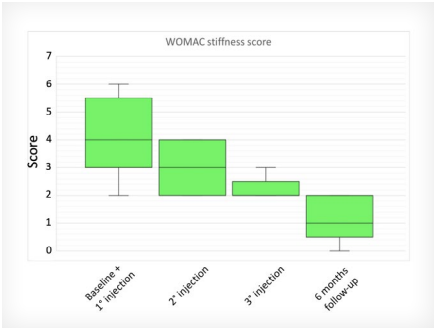

Fig. 6 *– BOX Plot of WOMAC related to joint stiffness. At the last follow-up there is a decrease in stiffness of approximately 69% from baseline.*

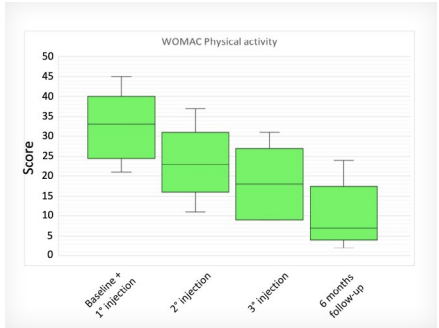

Fig. 7 *– BOX Plot of WOMAC related to functional recovery. At the last follow-up there is a functional recovery of about 69% compared to the initial situation.*

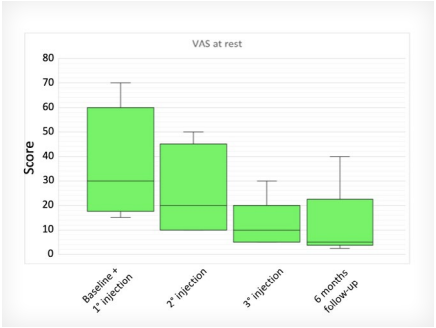

Fig. 8 *– BOX Plot of the VAS at rest. At the last follow-up, there was a decrease in pain of approximately 69% from baseline.*

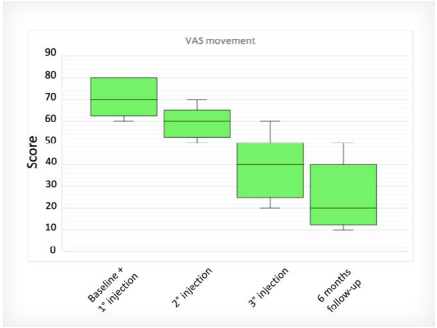

Fig. 9 *– BOX Plot of the VAS in motion. At the last follow-up, there is a decrease in pain of approximately 65% from baseline.*

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