INTRAARTICULAR TMJ INJECTIONS OF AUTOLOGOUS CONDITIONED SERUM IN THE TREATMENT OF TEMPOROMANDIBULAR JOINT OSTEOARTHRITIS: DESCRIPTION OF THE PROCEDURE AND DEVELOPMENT OF A PILOT STUDY

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Background

- Arthritis or osteoarthritis of the temporomandibular joint (TMJ-OA) is a degenerative disorder involving the joint characterized by deterioration of articular tissue with concomitant osseous changes in the condyle and/or articular eminence and the presence of pain(1).
- Clinical treatments of TMJ-OA are focused on the relief of TMJ pain and to improve function. Recent studies attempted to shift the metabolic status of the joints from the catabolic to the anabolic state using autologous intra-articular injections of growth factors(2) or stem cells(3).
- Autologous conditioned serum (ACS) was developed in the mid 90's and the therapeutic safety and efficacy of ACS has been shown in controlled clinical trials for knee osteoarthritis and lumbar radiculopathy(4). ACS's efficacy has been ascribed to increased levels of anti-inflammatory cytokines and growth factors (e.g. TGF-ß, IGF1, IL-1Ra), achieved through incubation - which distinguishes ACS from PRP(5). In a literature review the ACS therapy has been described as a therapeutic option in TMJ-OA with an A level evidence(6).

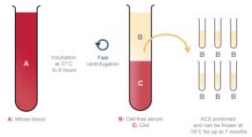
Methods

10 patients with TMJ-OA were treated with one-shot cell-free ACS alone (2,25 mL) or with ACS in combination with triamcinolone (ACS 2,25 ml + triamcinolone 0,25 ml). Before TMJ was infiltrated with ACS, TMJ was anesthetized with an infiltration of the auriculotemporal nerve with lidocaine without vasoconstrictor in all patients.

The outcomes were studied in 5 different study times and were obtained by direct measures and from validated questionnaires(1):

- Visual Analog Scale (VAS).
- Maximal Voluntary (non asisted) Mouth Opening (MVMO).
- The Jaw Functional Limitation Scale (JFLS-20).
- Graded Chronic Pain Scale (GCPS-30 day version).
- Radiographic study using software superinposed TMJ - Cone Beam Computed Tomography scans (T0/T5).

Safety has been evaluated at each visit.



Study Design

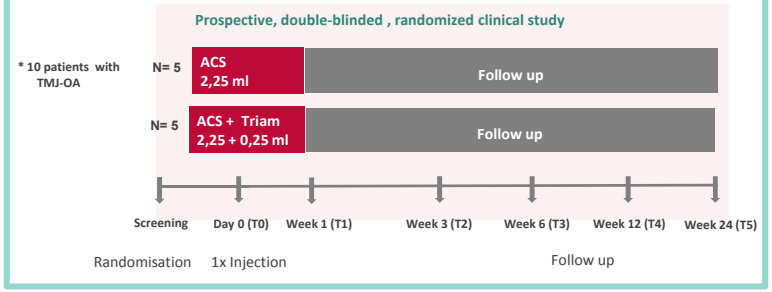


Table 1. study Design

Results

Visual Analog Scale (VAS) was completed from all patients at baseline to week 24 at all visits. The VAS value was reduced from 7 to 1,5 in average in patients treated with ACS + triam and from 7.5 to 2 in patients treated with ACS alone.

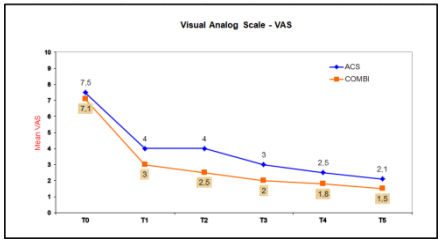


Table 2. VAS change in both groups over time

Maximal Voluntary (non asisted) Mouth Opening (MVMO) was measured from physician at baseline to week 24 at all visits. The MVMO value increased 38 to 44 mm in average in patients treated with ACS + triam and from 36 to 40 mm in patients treated with ACS alone.

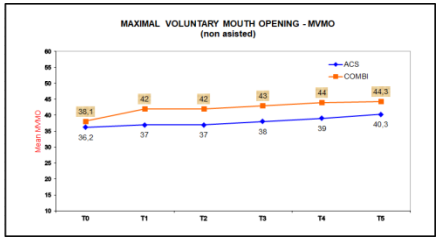


Table 3. MVMO change in both groups over time

Graded Chronic pain Scale (GCPS-30) was completed from all patients at baseline to week 24 at all visits. We considered only Characteristic Pain Intensity .The CGPS-CPI value was reduced from 65 to 15 in average in patients treated with ACS + triam and from 70 to 20 in patients treated with ACS alone.

Jaw functional Limitation Scale (JFLS-20) was completed from all patients at baseline to week 24 at all visits, considering the Global Score. The JFLS value was reduced from 2,1 to 0.19 in average in patients treated with ACS + triam and from 2.1 to 0.3 in patients treated with ACS alone.

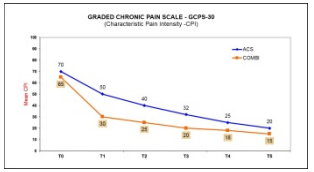


Table 4. GCPS change in both groups over time

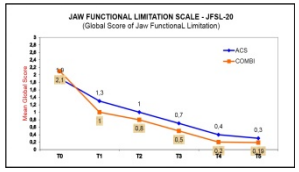


Table 5. JFSL change in both groups over time

Conclusions

- Cell-free ACS therapy appears to be an option in the treatment of non-restrictive OA.
- The combination of cell-free ACS with triamcinolone treatment leads to higher pain reduction as with ACS treatment alone. Also the measured mouth opening was higher under the combination treatment.
- No safety issues were observed during the study.
- Further clinical studies are needed to varify the results of this pilot study.

References

1. Diagnostic Criteria for Temporomandibular Disorders (2014). International RDC/TMD Consortium Network and Orofacial Pain Special Interest Group. J Orofac Pain 2014;28(1):1-27; http://www.rdc-tmdinternational.org.
2. Chang KV, Hung CY, Aliwarga F, Wang TG, Han DS, Chen WS. Comparative effectiveness of platelet-rich plasma injections for treating knee joint cartilage degenerative pathology: a systematic review and meta-analysis. Arch Phys Med Rehabil 2014;95(3):562-75.
3. Zhang S, Yap AU, Toh WS. Stem Cells for Temporomandibular Joint Repair and Regeneration. Stem Cell Rev. 2015 Oct;11(5):728-42.
4. Evans Ch. et al. Autologous Conditioned Serum. Phys Med Rehabil Clin N Am 27 (2016) 893–908
5. Weisshaar M. et al. Signaling Proteins (Growth Factors and Cytokines) in Orthopaedics. Comparison of two blood processing techniques: ORTHOKINE® and ACP®. CORS congress 2013 Venice, Italy
6. Ivarez-Camino JC, Vázquez-Delgado E, Gay-Escoda C. Use of autologous conditioned serum (Orthokine®) for the treatment of the dege-nerative osteoarthritis of the temporomandibular joint. Review of the literature Med Oral Patol Oral Cir Bucal. 2013 May 1;18

Disclosures

- **Wehling P:** CEO of ORTHOGEN AG. ORTHOGEN AG holds patents on ACS Technology.
- The authors disclosed no conflict of interest during the preparation or publication of this study.