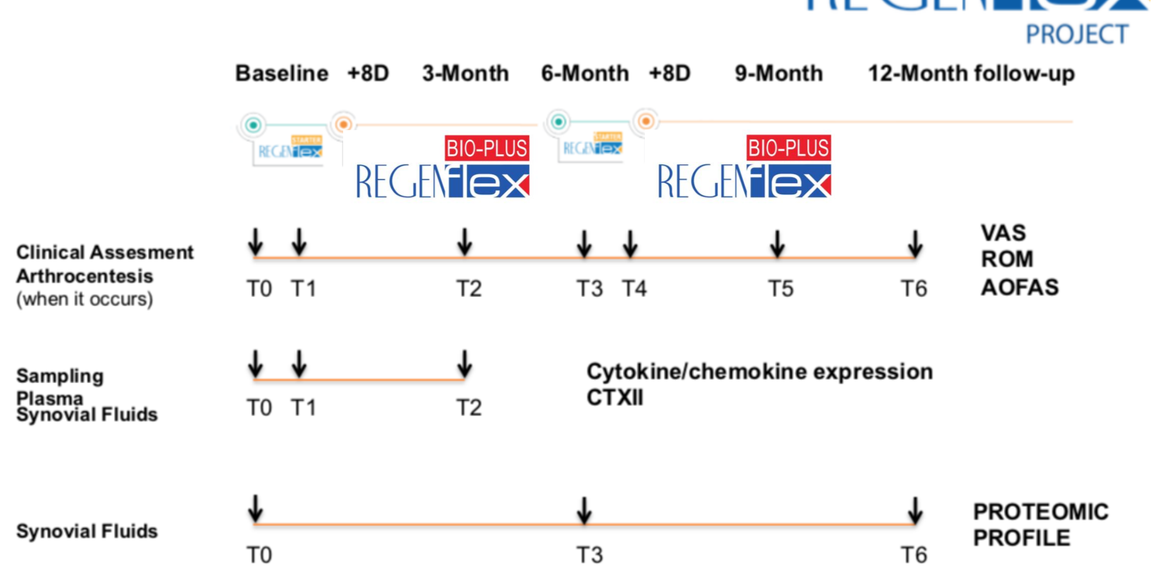
Efficacy of timed and sequential intra-articular injections of linear and of cross-linked hyaluronic acid in patients with knee osteoarthrosis

E. Barbieri, P. Sestili, G. Annibalini, L. Vallorani,
***V. Natalucci**, S. Contarelli, D. Ligi, L. Croce, V. Stocchi, and I. Capparucci*
Department of Biomolecular Sciences, Exercise and Health Sciences Unit, University of Urbino Carlo Bo, Urbino (PU)

Background

Knee gonarthrosis (GA) is a leading cause of disabling joint disease, especially in the elderly [1]. The aim of this study was to evaluate the clinical and biochemical effects of timed and sequential intrarticular injections of two different hyaluronic acid (HA) formulations in ameliorating joint pain and function in adult (A) and elderly (E) patients with knee osteoarthrosis.

Experimental design

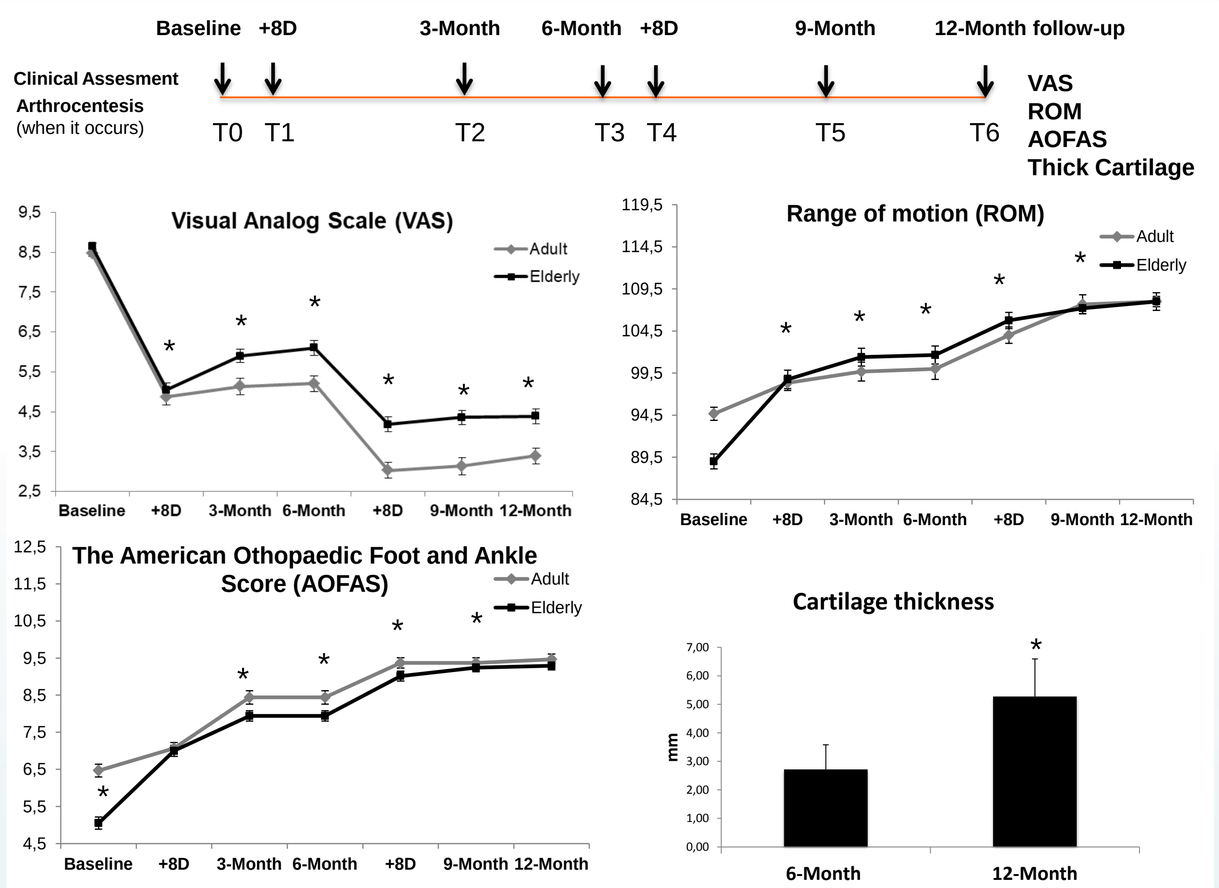


Viscosupplementation regime

T0 RegenFlex Starter (32mg/2ml MW 800 1200 kDa)
T1 (8 days) RegenFlex BIOPLUS (75mg/3ml MW 1M+2M and 500 kDa)

Treatment was repeated after 6 months from T0.

Clinical data



	Baseline		8-Day		6-Month		6-Month+8-Day		12-Month	
Arthrocentesis	19 (8 bilateral - 11 unilateral)		8 (7 bilateral - 1 unilateral)		7 (2 bilateral - 5 unilateral)		5 (2 bilateral - 3 unilateral)		5 (2 bilateral - 3 unilateral)	
	Rigth	Left	Rigth	Left	Rigth	Left	Rigth	Left	Rigth	Left
cc	23,50	18,18	21,00	17,13	11,00	13,00	5,50	9,60	5,25	8,00
es	5,82	3,51	4,06	3,24	5,30	2,54	4,55	1,72	4,80	0,91

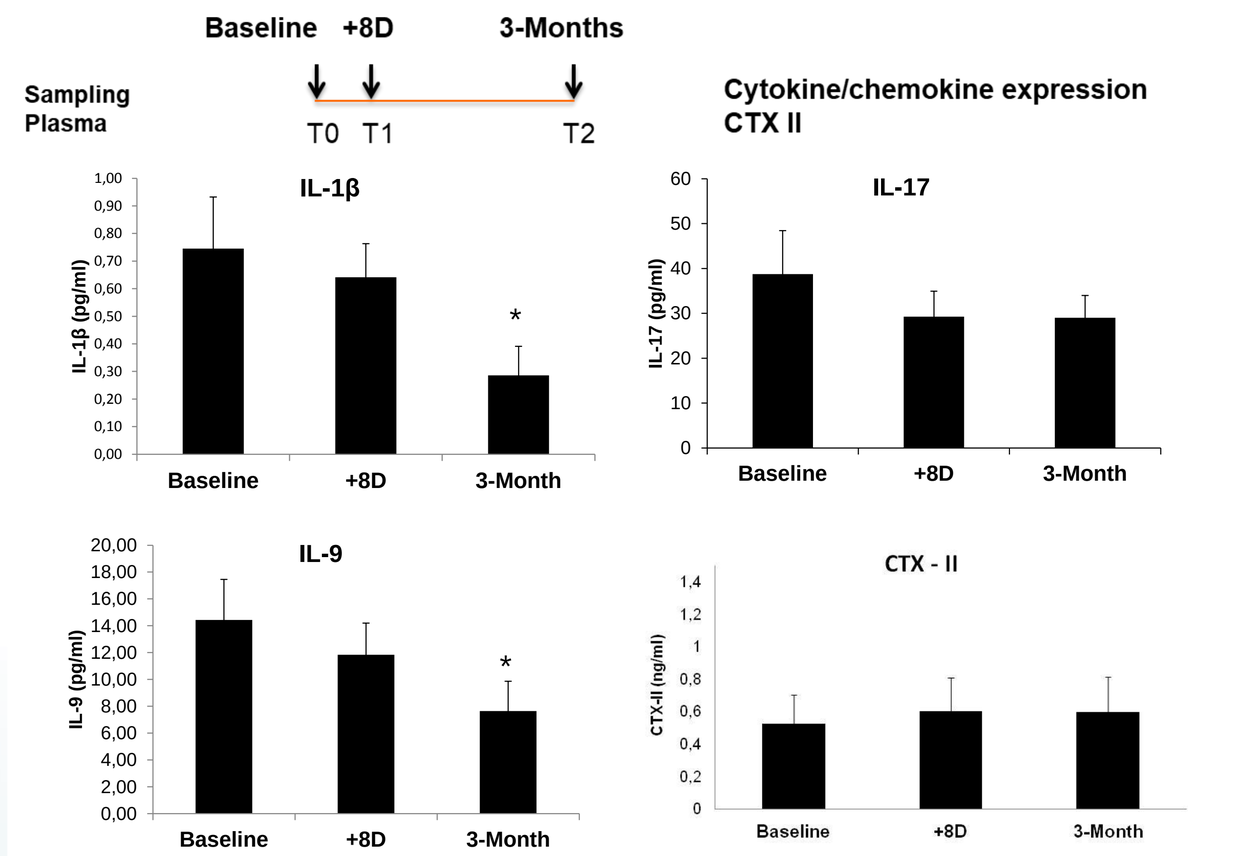
Clinical data obtained over the entire 12 months period, shows that sequential RegenFlex Starter and Bioplus HA treatment significantly improved knee function and pain scores in both A and E, independently from BMI, gender, and level of physical activity. Patients also experienced a mean increase in their medial cartilage thickness.

Study group characteristics (n. 39)

Variabile	Group 1 (Age<65)	Group 2 (Age≥65)	p-value (Mann-Whitney U)
Subjects	19	20	
Age (years)	53,32±10	76,45±7,66	<0,0001
Male	13	13	
Female	6	7	
Smoking (yes or past)	8	8	
Weight (kg)	71,1±8,3	68,6±10,35	0,481
Height (cm)	1,73±0,076	1,69±0,11	0,398
BMI (kg/m²)	23,72±2,45	23,82±2,42	0,855
LAF	1,5±0,23	1,44±0,23	0,236
Bilateral (Yes)	4	10	
Bilateral (No)	15	10	
LS	6	9	
DRY	13	11	

GA patients (radiographic Kellgren stage II–III) BMI, body mass index; LAF, level of physical activity; LS, synovial fluid; DRY, no synovial fluid.

Biochemical data



Biochemical data indicates that sequential RegenFlex Starter and Bioplus HA treatment promoted an anti-inflammatory response paralleled by a coherent and time-dependent modulation of specific cytokines, and induced chondro-protective effects in subjects with grade II arthropathy.

Proteomic approach in SF revealed that proteins associated with inflammation such as Haptoglobin α1 antitrypsin decreased, while Transthyretin, an inhibitor of IL1, increased.

Conclusions

RegenFlex Starter and Bioplus HA injections to treat knee SF arthropathy significantly ameliorated joint pain score limiting disease progression, especially in low degree chondropathy.

References
1. Nicholls et al. Clinical Medicine Insights: Arthritis and Musculoskeletal Disorders 2017

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