

ONE-YEAR PERFORMANCE OF POLYACRYLAMIDE HYDROGEL VS. HYALURONIC ACID IN AGE, BMI AND KELLGREN-LAWRENCE SUBGROUPS: A SUBGROUP ANALYSIS OF A RANDOMISED STUDY

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PURPOSE

To compare the effectiveness of a single intra-articular injection of Arthrosamid[®] with that of observed injection of hyaluronic acid (Synvisc-One[®]) in subgroups of participants based on age, BMI or Kellgren-Lawrence (KL) grade at baseline by assessing changes from baseline to 52 weeks in transformed WOMAC pain subscale scores.

MATERIALS & METHODS

- This was a prospective, double-blind multicentre study conducted at 3 sites in Denmark.
- 239 participants were randomised 1:1 to receive a single intra-articular injection of either 6 mL Arthrosamid (n=119) or 6 mL Synvisc-One (n=120). Injections were given by an investigator experienced in administering intra-articular injections, who was not involved further with the participants.
- Participants could continue analgesics (except 48 hours prior to visits) and non-pharmacological therapy, but topical (on target knee) and systemic corticosteroids or additional injections were not allowed.
- The pre-specified statistical analyses of the subgroups were based on the least squares means for the treatment-by-week interaction effect using a mixed model for repeated measurement with a restricted maximum likelihood-based approach. The estimated mean treatment difference based on this model was reported with two-sided symmetric 95 % CI and the corresponding p-value.

RESULTS

- Treatment differences in favour of Arthrosamid compared to hyaluronic acid were observed for both age subgroups. The difference was statistically significant in the subgroup with age at baseline <70 years, but not in the subgroup with age at baseline ≥70 years (Table 1).
- Treatment differences in favour of Arthrosamid compared to hyaluronic acid were observed in the WOMAC pain subscale for each subgroup based on BMI category. The difference was statistically significant in the normal subgroup but not in the obese or overweight subgroups (Table 2).
- Treatment differences in favour of Arthrosamid compared to hyaluronic acid were observed in the WOMAC pain subscale for KL grade 2 and KL grade 3, while a treatment difference in favour of hyaluronic acid was measured for KL grade 4. None of the treatment differences were statistically significant (Table 3).

Table 1: Analyses of change from baseline to week 52 in transformed (0-100) WOMAC pain subscale by age category

	N*	LSMean (95% CI)	Treatment difference (95% CI)	p-value
Baseline age < 70 years				
Synvisc-One	62	-14.0 (-18.3; -9.6)		
Arthrosamid	63	-21.3 (-25.5; -17.0)	7.3 (1.2; 13.4)	0.0195
Baseline age ≥ 70 years				
Synvisc-One	47	-12.5 (-17.6; -7.4)		
Arthrosamid	44	-13.4 (-18.7; -8.2)	1.0 (-6.3; 8.2)	0.7970
All patients				
Synvisc-One	109	-13.3 (-16.7; -10.0)		
Arthrosamid	107	-17.9 (-21.3; -14.6)	4.6 (-0.1; 9.4)	0.0572

* 11 patients in the Synvisc-One group and 12 patients in the Arthrosamid group withdrew prior to the week 52 visit and are therefore not included at 52 weeks in the analysis. CI: confidence interval; N: Number of subjects; LSMean: Least squares mean; WOMAC: Western Ontario and McMaster Universities Osteoarthritis Index. The analysis was performed on change from baseline using a mixed model for repeated measures including fixed, categorical effects of treatment, week, treatment-by-week interaction and site, as well as the baseline value and baseline-by-week interaction as covariates.

Table 2: Analyses of change from baseline to week 52 in transformed (0-100) WOMAC pain subscale by BMI category

	N*	LSMean (95% CI)	Treatment difference (95% CI)	p-value
Normal (18.5 - 24.9 kg/m²)				
Synvisc-One	35	-10.6 (-15.8; -5.3)		
Arthrosamid	24	-21.4 (-27.8; -15.0)	10.9 (2.6; 19.1)	0.0110
Overweight (25 - 29.9 kg/m²)				
Synvisc-One	51	-14.3 (-19.5; -9.2)		
Arthrosamid	57	-16.1 (-21.0; -11.3)	1.8 (-5.3; 8.9)	0.6114
Obese (above 30 kg/m²)				
Synvisc-One	23	-14.5 (-22.7; -6.2)		
Arthrosamid	26	-17.8 (-25.6; -10.0)	3.3 (-8.0; 14.7)	0.5565
All patients				
Synvisc-One	109	-13.3 (-16.7; -10.0)		
Arthrosamid	107	-17.9 (-21.3; -14.6)	4.6 (-0.1; 9.4)	0.0572

* 11 patients in the Synvisc-One group and 12 patients in the Arthrosamid group withdrew prior to the week 52 visit and are therefore not included in the analysis. CI: confidence interval; N: Number of subjects; LSMean: Least squares mean; WOMAC: Western Ontario and McMaster Universities Osteoarthritis Index. The analysis was performed on change from baseline using a mixed model for repeated measures including fixed, categorical effects of treatment, week, treatment-by-week interaction and site, as well as the baseline value and baseline-by-week interaction as covariates.

Table 3: Analyses of change from baseline to week 52 in transformed (0-100) WOMAC pain subscale by Kellgren-Lawrence grade

	N*	LSMean (95% CI)	Treatment difference (95% CI)	p-value
Grade 2				
Synvisc-One	54	-15.3 (-20.4; -10.3)		
Arthrosamid	61	-18.8 (-23.5; -14.1)	3.5 (-3.6; 10.5)	0.3305
Grade 3				
Synvisc-One	40	-11.0 (-16.5; -5.5)		
Arthrosamid	35	-18.4 (-24.3; -12.5)	7.4 (-0.7; 15.5)	0.0722
Grade 4				
Synvisc-One	15	-13.1 (-21.9; -4.3)		
Arthrosamid	11	-10.3 (-20.6; 0.0)	-2.8 (-16.4; 10.8)	0.6757
All patients				
Synvisc-One	109	-13.3 (-16.7; -10.0)		
Arthrosamid	107	-17.9 (-21.3; -14.6)	4.6 (-0.1; 9.4)	0.0572

* 11 patients in the Synvisc-One group and 12 patients in the Arthrosamid group withdrew prior to the week 52 visit and are therefore not included in the analysis. CI: confidence interval; N: Number of subjects; LSMean: Least squares mean; WOMAC: Western Ontario and McMaster Universities Osteoarthritis Index. The analysis was performed on change from baseline using a mixed model for repeated measures including fixed, categorical effects of treatment, week, treatment-by-week interaction and site, as well as the baseline value and baseline-by-week interaction as covariates.

CONCLUSION

In participants with normal BMI or participants <70 years old Arthrosamid performed statistically significantly better than hyaluronic acid at 52 weeks after treatment. In all other subgroups, except for the subgroup with KL grade 4, Arthrosamid was numerically superior to hyaluronic acid.

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