Knee OsteoArthritis Radiographic Severity and Initial Pain Level Influencing Short and Mid-Term Response Rate After Viscosupplementation Treatment by Combined Hyaluronic Acid and Sorbitol

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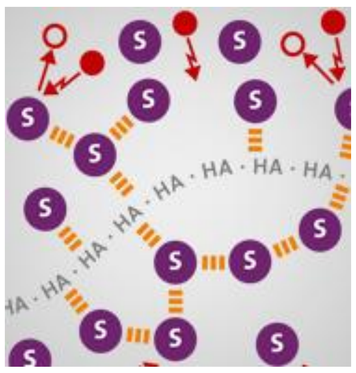
Background

Synolis V-A is a visco-antalgic formulation indicated for viscosupplementation in OsteoArthristis. Synolis V-A is composed of highly concentrated non-crosslinked hyaluronic acid (2%) from biofermentation origin combined with a high concentration of sorbitol (4%). Sorbitol is an endogenous molecule which functions as an oxygen free radical (OFR) scavenger. Rapid and strong pain reduction in patients with knee OsteoArthritis (OA) has been observed in several previous studies using Synolis V-A.



Objective

We hypothesize that one of the dimensions of average pain reduction is a variable response rate to treatment. In addition, we hypothesize that this variable response rate could be associated to radiographic severity, initial pain level and intra-articular injection regimen.

Patients and Methods

Among 1147 patients with a majority suffering from knee Osteoarthritis (92.9%) enrolled in a Non-Interventional Study conducted by Rottapharm Madaus in 398 centres in Germany following recommendations from the BfArM (Federal Institute for Drugs and Medical Devices) and the Paul-Ehrlich-Institute, 455 patients met the inclusion criteria (reported Kellgren-Lawrence grade and initial pain level at baseline, at week1 and/or at week 24) and received either 1 or 3 injections of Synolis V-A 2ml (GO-ON matrix in Germany) one week apart.

This population was then grouped according to two severity evaluation factors:

- Two groups were created according to Kellgren-Lawrence (K-L) based severity (K-L.) I/II (39.3%) & K-L. III/IV (60.7%) – *figure 1*.
- Two groups were created according to Walking Pain (WP) at baseline (5 points Likert scale): None (1.1%), Mild (8.6%), Moderate (35.8%), Severe (45.1%), Very Severe (7.5%) and Not Reported (2.0%) – *figure 2*. The Low Pain group combined patients with Mild/Moderate pain and the High Pain group combined patients with Severe/Very Severe Pain.

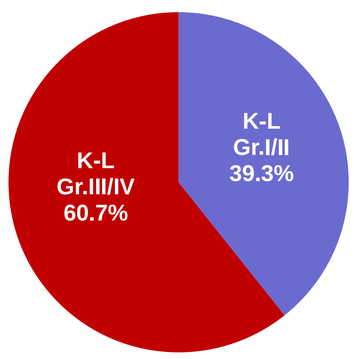


Figure 1: Patients repartition based on their Kellgren-Lawrence Grade

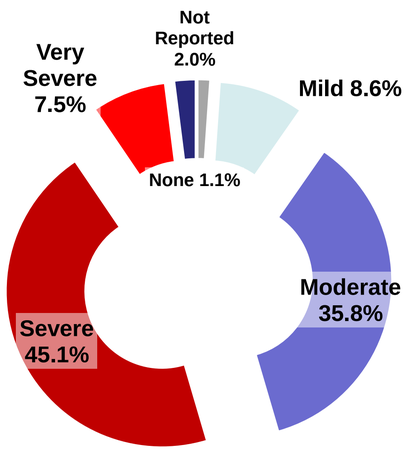


Figure 2: Patients repartition based on their Initial Pain level

Two analyses were conducted comparing at week 1 and week 24 vs. the rate of responders for both 1 and 3 injections regimen vs. baseline, for Low K-L. (I/II) and High K-L. (III/IV) on one hand, and for Low Pain (Mild to Moderate) and High Pain (Severe to Very Severe) on the other hand.

Patients defined as responders were patients with pain decrease of at least 1 point on the Likert scale vs. baseline.

Results

For both Low and High K-L patients groups, the percentage of responders was similar at week 1 with respectively 68.6% and 66.1%.

At week 24 all sub-groups of patients (Low and High K-L groups receiving either 1 or 3 injections) obtained an average response rate above 80%. However, when patients from the Low K-L group receiving 1 or 3 injections and patients from the High K-L goup receiving 1 injection had comparable average response rate, comprised between 81.3% and 82.7% of responders; patients from the High K-L group who received 3 injections obtained a much higher responders rate of 93.1% - *figure 3*.

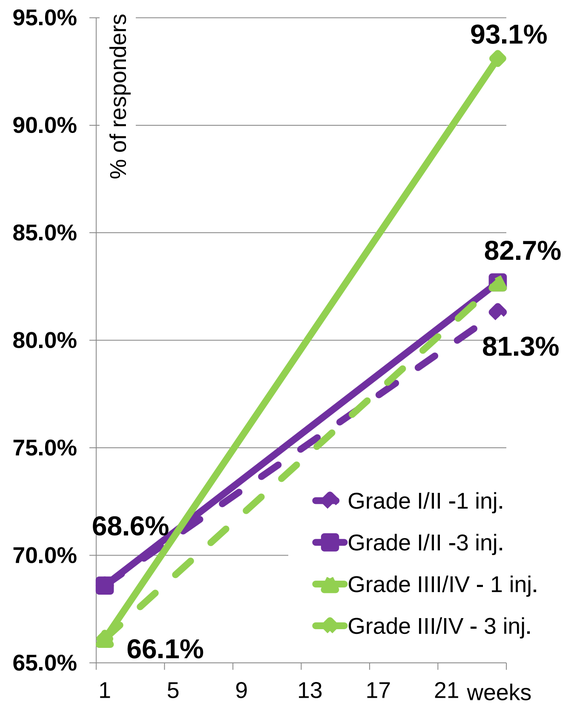


figure 3: rate of responders according to K-L and inj. regimen

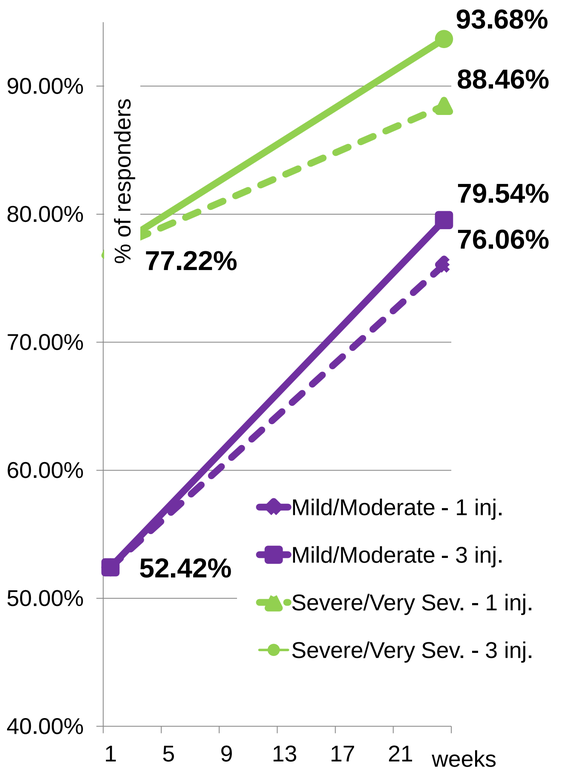


figure 4: rate of responders according to WP Pain and inj. regimen

On the other hand, the percentage of responders between Low Pain and the High Pain groups was different right from week 1 with respectively 52.4% and 77.2%.

At week 24 all sub-groups of patients (Low and High Pain groups receiving either 1 or 3 injections) obtained response rate above 75%. Three injections regimen always provided better response rate vs. 1 injection regimen with respectively 79.5% vs. 76.1% for the Low Pain group and 93.7% vs. 88.5% for the High Pain group – *figure 4*.

Conclusion

This study suggests that the fast average pain relief commonly observed after the first injection of Synolis V-A could partly be explained by the high number of responders reported at week 1 (67.1%).

On the short-term, the initial pain level seemed to be a better predictor of response rate, with a response rate 47.3% higher for High vs. the Low Pain group; which could be explained by the non-linear pain scoring system used.

At week 24, the radiographic severity seemed to be an efficient indicator for adapting the injection regimen, suggesting the use of 3 injections for K-L Gr. III & IV patients since the observed response rate was 12.6% higher than for the single regimen.