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Carrageenan nasal spray against common cold: a pooled analysis of two randomized, double-blind, placebo controlled studies

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Introduction

Acute viral respiratory infection (AVRI), also known as common cold, is caused by more than 200 different viruses, among them rhino- (hRV), corona- (hCV), and influenza viruses (InfA and InfB); frequently more than one virus is present in nasal fluids. AVRI has the highest incidence among human diseases, reducing its severity and duration would lead to substantial economic and quality-of-life benefit.

Iota-carrageenan, a seaweed extract, creates a protective layer on the nasal mucosa and is effective against a broad variety of respiratory viruses (Grassauer et al., 2008; Leibbrandt et al., 2010). The effects of a nasal spray containing 0.12% iota-carrageenan on clinical symptoms and diagnostic parameters of pediatric and adult patients laboring from an early AVRI were evaluated in two independent clinical studies. In a pooled analysis, patients with viruses detected in nasal fluids were re-analyzed with respect to clinical and virological parameters. In addition, subgroups of patients with positive PCR for hRV, hCV and InfA were analyzed.

Red seaweed (natural source of carrageenans)

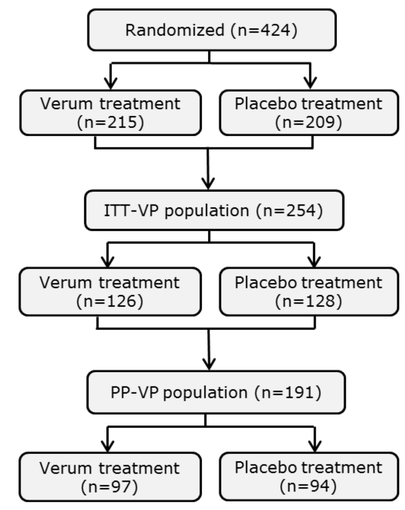
Patients and Methods

254 subjects with early symptoms of common cold were included into this pooled analysis of two randomized clinical trials. The study medication, a verum iota-carrageenan nasal spray or a placebo saline nasal spray, was administered 3 times a day, one puff (140µl) per nostril, for a period of 7 days.

Common cold symptom scores were recorded in a diary for 7 or 9 days, respectively; from day 8 or 10 to 21 patients recorded the presence or absence of symptoms. Nasal lavages collected on day 1 and day 4±1d were analyzed by real-time PCR for a broad variety of respiratory viruses viruses (InfA/B, hRV, hCV, PIV, RSV, hMPV).

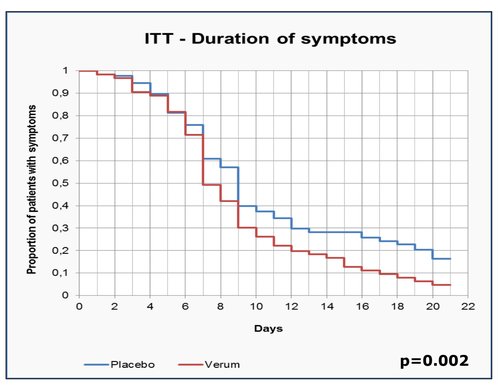
254 (ITT) or 191 (PP) patients were included in the analysis of the clinical effectiveness. The antiviral effectiveness was calculated from data obtained from 236 patients in the ITT and 174 in the PP population.

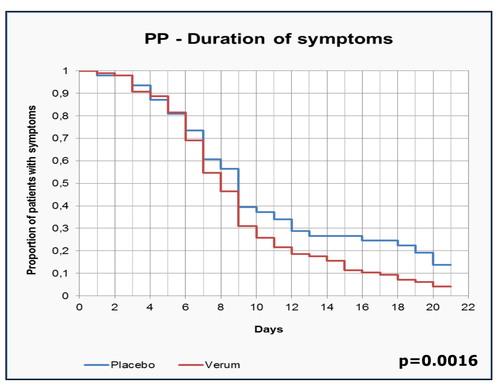
ITT-VP = Intention-to-treat and virus positive population
PP-VP = Per-protocol and virus positive population
ITT = Intention-to-treat population
PP = Per-protocol population



Disposition of patients included in the pooled analysis

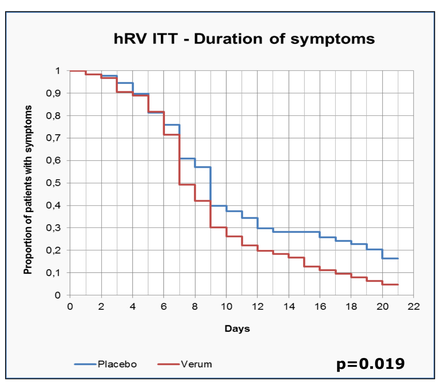
Results – Clinical Effectiveness

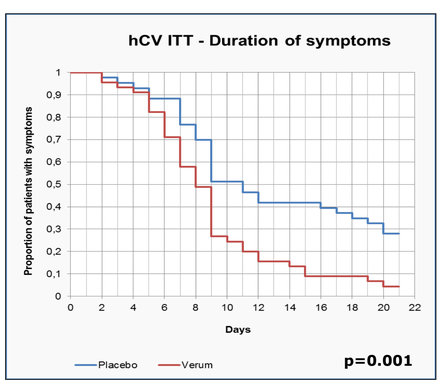


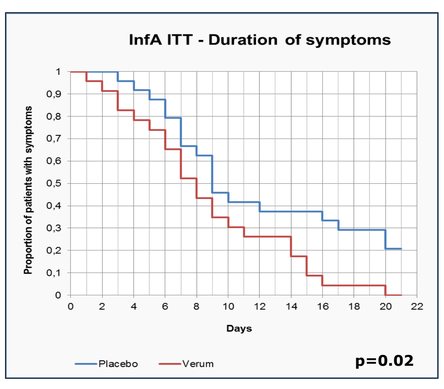


Decrease in disease duration in the whole population

In the ITT population the average duration of disease was 1.9 days shorter in the verum group compared to placebo (9.0 compared to 10.9 days in the verum and placebo group, respectively, p=0.002). In the PP population duration of disease was 1.6 days shorter in the verum group (9.1 compared to 10.7 days in the verum and placebo group, respectively, p=0.016).

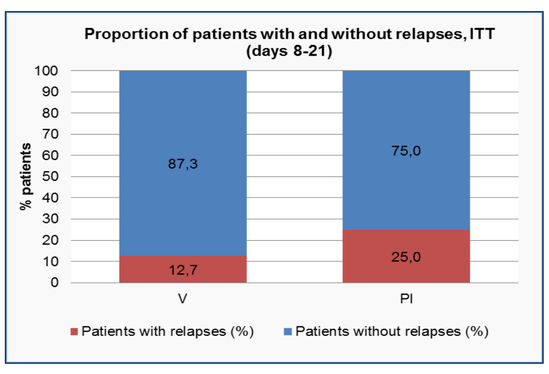






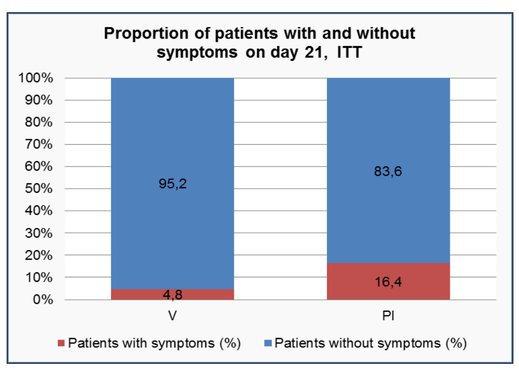
Decrease in disease duration in the subpopulations of hRV, hCV and Inf-A virus

Clinical and antiviral effectiveness of the carrageenan-containing nasal spray (decrease in disease duration, decrease in the number of relapses and proportion of patients with common cold symptoms on day 21) was also confirmed in subgroups of patients infected with the most frequent viruses causing common colds: hRV (disease duration reduced by 1.9 days), hCV (reduction by 3.9 days) and InfA (reduction by 3.3 days).



Reduction of relapses

Even after the end of treatment the proportion of patients with relapses was still about two times higher in the placebo group: in the ITT population relapses were experienced by 16/126 (12.7%) verum patients compared to 32/128 (25.0%) placebo patients (p=0.012). PP: reduction of relapses from 25.5 to 13.4 %; p=0.034

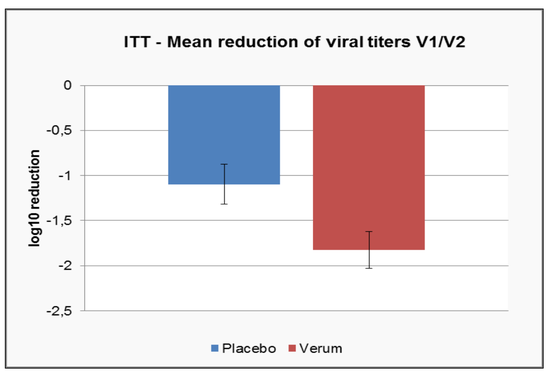


Enhanced freedom of symptoms on day 21

The proportion of patients experiencing common cold symptoms on day 21 was more than three times higher in the placebo group. In the ITT population, only 6/126 (4.8%) verum patients had symptoms on day 21 compared to 21/128 (16.4%) placebo-treated patients (p=0.003).

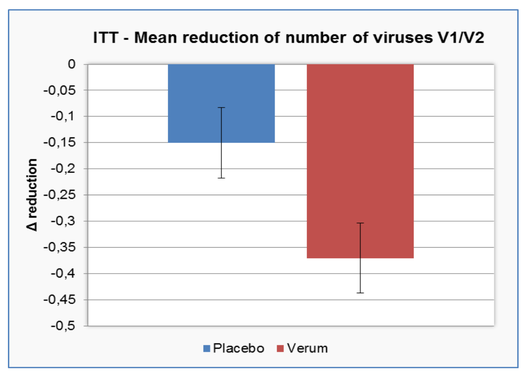
PP: reduction from 13.8 to 4.1 %; p=0.019

Results – Antiviral Effectiveness



Reduction of virus titer

In both verum and placebo group, there was a significant decrease in viral titers from visit 1 to visit 2; however, this decrease was more pronounced in verum patients with a statistically significant difference between groups in the ITT population (p=0.015).



Higher elimination of number of viruses

The decrease in the number of detected viruses per patient from visit 1 to visit 2 was about two times more pronounced in the verum group in both the ITT (p=0.02) and PP (p=0.025) population. On average, placebo patients cleared 0.15 viruses in the ITT and 0.14 viruses in the PP population.

Conclusions

Iota-carrageenan nasal spray is a safe and effective treatment for patients suffering from common cold. It reduces clinical parameters due to a significant reduction of viral load in nasal fluids. Also noteworthy, the application of iota-carrageenan also reduces the number of relapses indicating that an early intervention in the course of an infection reduces the risk of recurring symptoms.

Reference: 1. Grassauer, A., Weinmüllner, R., Meier, C., Pretsch, A., Prieschl-Grassauer, E., Unger, H. 2008, "Iota-Carrageenan is a potent inhibitor of rhinovirus infection", Virol.J., Vol. 5, No. 107, pp
2. Leibbrandt, A., Meier, C., König-Schuster, M., Weinmüllner, R., Kalthoff, D., Pflugfelder, B., Graf, P., Frank-Gehrke, B., Beer, M., Fazekas, T., Unger, H., Prieschl-Grassauer, E., Grassauer, A. 2010, "Iota-carrageenan is a potent inhibitor of influenza A virus infection", PLoS.One