Effect of Rhamnogalacturonan-I on Anti-Viral Response in Healthy Subjects

R. Lutter[1], A. Teitsma-Jansen[2], E. Floris[3], S. Lone-Latif[2], A. Ravi[4], Y. S. Sabogal[4], T. Dekker[4], B. Smids[4], R. Khurshid[4], M. Aparicio[5], R. Ruijschop[6], L. Ravanetti[4], W. Calame[7], A. Kardinaal[6], R. Albers[5]; [1]Respiratory Medicine and Experimental Immunology, AmsterdamUMC/University of Amsterdam, Amsterdam, Netherlands, [2]Respiratory Medicine, AmsterdamUMC/University of Amsterdam, Amsterdam, Netherlands, [3]Respiratory Medicine, NIZO, Ede, Netherlands, [4]Experimental Immunology, AmsterdamUMC/University of Amsterdam, Amsterdam, Netherlands, [5]Nutrileads, Wageningen, Netherlands, [6]NIZO, Ede, Netherlands, [7]Statistical BV, Wassenaar, Netherlands.

Corresponding author's email: r.lutter@amc.uva.nl

RATIONALE: Acute respiratory viral infections can lead to significant morbidity and mortality. We assessed the immune-modulating capacity of rhamnogalacturonan-I (cRG-I), as dietary supplement, on virus-induced responses in healthy individuals. METHODS: Study product was taken 8 weeks prior and 2 weeks after viral exposure at 0, 0.3 and 1.5 g/d to assess dose-response relationships. In a double-blind study, 56 participantsper arm were randomized without stratification by the pharmacy and targeted for intranasal exposure to rhinovirus 16. Changes in severity and duration of symptom scores and viral load in nasal lavage were primary outcomes. Secondary outcomes were changes in CXCL10/IP-10 and CXCL8/IL-8 levels, cell differentials in nasal lavage and, in a nested cohort, transcriptome analyses of nasal epithelium. ITT, PP and safety analyses were performed by an independent statistician. The study was registered with Netherlands Trial Register (6773) and performed in one academic hospital (Netherlands). RESULTS: 146 volunteers, 46, 49 and 51 for 0, 0.3 and 1.5 g/d dose-groups respectively, completed the study between November 2017 and October 2018. Intake of 0.3 g cRGI/d reduced common cold symptoms by 20% and led to a 25% earlier decline in symptoms, compared to dose 0 and 1.5 (GEE model dosing/time coefficient: -0.005 [95% CI interval: -0.007 - -0.004]). cRG-I accelerated and enhanced most parameters of the nasal innate immune response to RV16 exposure in a dose-dependent manner. The transcriptome analyses revealed an accelerated interferon-induced response in the 0.3 dose-group, paralleled by induction of key antiviral gene EIF2AK2 and a faster viral clearance. 432 AEs were registered; 33.3%, 34.5% and 32.2% for 0, 0.3 and 1.5 g/d dose-groups, respectively, with no relation to cRG-I intake. CONCLUSION: cRG-I intake in a dose-dependent manner modulates antiviral and innate immune responses, diminishing severity and duration of a rhinovirus 16 infection. To the best of our knowledge this is one of the most effective interventions if not the most effective intervention for food supplements and probiotics. Given that the antiviral response to acute respiratory virus infections relies heavily on the innate immune responses, cRG-I intake may also proof effective for limiting other respiratory viral infections.

This abstract is funded by: Nutrileads and EU