

Treatment of COVID-19 patients with a SARS-CoV-2-specific siRNA-peptide dendrimer formulation

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Abstract

BACKGROUND Severe acute respiratory syndrome corona virus (SARS-CoV-2) infection frequently causes severe and prolonged disease but only few specific treatments are available. We aimed to investigate safety and efficacy of a SARS-CoV-2-specific siRNA-peptide dendrimer formulation (MIR 19 ®) targeting a conserved sequence in known SARS-CoV-2 variants for treatment of COVID-19. **METHODS** We conducted an open-label, randomized controlled multicenter phase II trial (NCT05184127) evaluating safety and efficacy of inhaled MIR 19 ® (3.7mg and 11.1 mg/day: groups 1 and 2, respectively) in comparison with standard etiotropic drug treatment (group 3) in patients hospitalized with moderate COVID-19. The primary endpoint was the time to clinical improvement according to predefined criteria within 14 days of randomization. **RESULTS** Patients from group1 had a significantly reduced (median 6 days (95% confidence interval [CI]: 5-7, HR 1.75, P=0.0005) time to clinical improvement compared to patients from group 3 (8 days (95% CI: 7-10). Normalized oxygen saturation (SpO₂>94%) occurred quicker in the group 1 (median 5 days (95% CI: 4-5, HR 1.59, P=0.0033) than in the group 3 (6 days, 95% CI: 5-8). Treatment with MIR 19® was well tolerated and safe. **CONCLUSIONS** MIR 19 ®, a SARS-CoV-2-specific siRNA-peptide dendrimer formulation is safe and significantly reduces time to clinical improvement in hospitalized moderate COVID-19 patients compared to standard therapy in a randomized controlled trial. MIR 19 ® treatment targets a sequence which is identical in all SARS-CoV-2 variants known so far and hence should be applicable for all of them.

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