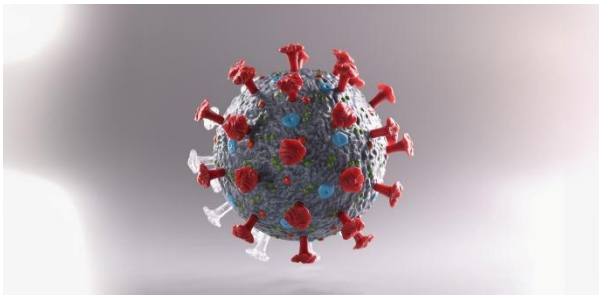
For COVID-19 Treatment Inhaled Antibody Therapy Shows Promise

Researchers examined the tolerability, safety, and pharmacokinetics of an inhaled antibody therapy for coronavirus disease 2019 (COVID-19).



Study

In the present study, researchers evaluated the safety, tolerability, and pharmacokinetics of an inhaled antibody therapy for COVID-19. They developed IN-006, a reformulation of regdanvimab, which is an IV-dosed mAb targeting the receptor-binding domain of the SARS-CoV-2 spike protein. This double-blind, phase 1, placebo-controlled study was conducted in Melbourne, Australia.

Adults aged 18–55 years with a body mass index of 18–32 kg/m2 were eligible if they were in good health based on medical history, electrocardiogram, hematology and clinical chemistry assessments, and physical examination.

Individuals with signs of active pulmonary infection or inflammation, suspected or known viral infection, and those with a history of angioedema, anaphylaxis, or airway hyperresponsiveness were excluded.

Participants were enrolled into single low-dose (30 mg), single high-dose (90 mg), or multiple high-dose (90 mg daily for one week) cohort. IN-006 was provided as a liquid formulation to be loaded into a vibrating mesh nebulizer.

Placebo subjects received saline. The primary endpoints were the incidence and severity of adverse events (AEs). Exploratory endpoints included antibody concentration in serum and nasal swabs.

Results

Overall, 23 participants were included; 17 were randomized to receive IN-006, and six were assigned to the placebo group between September 22 and December 29, 2021. IN-006 nebulization was well tolerated and was completed in six minutes on average for the high dose. Eight participants from single-dose cohorts developed at least one treatment-emergent AE (TEAE).

Among IN-006 recipients in single-dose cohorts, oropharyngeal pain, and headache were the most frequent TEAEs. All except one TEAE were mild; one low-dose IN-006 recipient developed a moderate event deemed unrelated to the study drug. Three participants had at least one AE related to the study drug; these included oropharyngeal pain, headache, and cough.

There were no TEAEs among placebo recipients in the multiple-dose cohort. However, six IN-006 recipients in the multiple-dose cohort had at least one TEAE, with dizziness being the most frequently reported.

The geometric mean IN-006 concentrations in the nasal fluid measured three hours after dosing were 146 µg/mL for the 30 mg dose and 459 µg/mL for the single 90 mg dose.

The geometric mean IN-006 concentration in the nasal fluid was 607 µg/mL measured 30 minutes after nebulization on days 1, 2, and 3 in the multiple-dose cohort, which was much higher than that measured at three hours (94 µg/mL).

Further, IN-006 was detected in serum 12 hours after dosing at the 90 mg dose. Serum concentrations increased by 120 hours after a single dose and 216 hours after the first dose in a multiple-dose cohort.

The serum elimination half-life of IN-006 was around 253, 292, and 402 hours for the single 30 mg dose, single 90 mg dose, and multiple 90 mg dose cohorts, respectively, which was similar to that of IV regdanvimab (288 hours).

Moreover, while serum IN-006 levels were much lower than nasal concentrations, serum levels remained above the half-maximal inhibitory concentration (IC50) range of potent antiviral mAbs.

Conclusion

Together, the study demonstrated that IN-006 was well tolerated and safe in healthy adults. High antibody levels were detected in the nasal fluid, with detectable levels in the serum. In addition, the IN-006 treatment had minimal side effects and was easily self-administered.

The study's limitations were the small sample size and the exclusive inclusion of healthy adults, limiting generalizability.

Moreover, the team could not directly measure drug levels in the LRT, as the prevailing COVID-19 protocols at the time prohibited the collection of bronchoalveolar lavage fluid (BALF).

Overall, these findings suggest that inhaled delivery of mAbs could effectively treat mild or moderate COVID-19 and reduce the risk of progression to severe disease, supporting the development of inhaled mAbs for respiratory illnesses.

Source:

https://www.news-medical.net/news/20250212/Inhaled-antibody-therapy-shows-promise-for-COVID-19-treatment.aspx