Intravenous MN-221, a Novel, Highly Selective Beta, Adrenergic Receptor Agonist, Improves Lung Function in Stable Moderate to Severe Chronic Obstructive Pulmonary Disease (COPD) Patients

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Abstract

• Intravenous MN-221, a novel, highly selective beta-2 adrenergic receptor agonist, is an effective and safe treatment for exacerbations of stable moderate to severe chronic obstructive pulmonary disease (COPD). MN-221 is a parenteral agent that improves lung function, provides rapid bronchodilation, and is well tolerated. The present study investigated the safety and efficacy of MN-221 in subjects with stable moderate to severe COPD.

Purpose

• To determine the safety and efficacy of MN-221 in exacerbations of stable moderate to severe COPD.

Background - COPD

• Defined as a pulmonary disease characterized by the presence of airflow obstruction due to chronic bronchitis or emphysema.

Method

• Randomized, double-blind, placebo-controlled Phase Ib escalation study in subjects with stable moderate to severe COPD. MN-221 was administered as an intravenous (i.v.) infusion of 40 μg/min for 15 min + 13.3 μg/min for 45 min, 100 μg/min for 15 min + 33.3 μg/min for 45 min, or 200 μg/min for 15 min + 66.7 μg/min for 45 min.

Efficacy

• Primary outcome measures included: change in FEV1, PEFR, FVC, and heart rate.

Pharmacokinetics - Plasma Concentrations

• Mean (+SE) peak MN-221 plasma concentrations were as follows: dose 300 µg: 0.09 ± 0.01 μg/mL; dose 600 µg: 0.18 ± 0.02 μg/mL; dose 1200 µg: 0.36 ± 0.04 μg/mL.

Conclusions on Efficacy

• Mean change from Baseline in FEV1 %Predicted at 60 min was 62% ± 15% for MN-221 and 8% ± 7% for Placebo.

Conclusions on Pharmacokinetics & Safety

• No clinically significant adverse drug effects were noted. Two subjects experienced hypokalemia.

Safety: MN-221 Mean Heart Rate

• No serious adverse events were reported. Two subjects experienced hypokalemia.

Conclusion Implications

• Overall, MN-221 was well tolerated and demonstrated efficacy in improving lung function while reducing the frequency and severity of exacerbations.

Overall Study Design and Plan

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Figure 8

• Pharmacokinetics - Plasma Concentrations

Safety: MN-221 Mean Heart Rate

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Figure 8

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