Nitric Oxide Inhalation in Cystic Fibrosis Patients Infected with Mycobacterium Abscessus Complex: A Prospective, Open-Labeled, Multi-Center Pilot Study


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BACKGROUND

Nitric Oxide

- Broad-spectrum antibacterial activity
- A regulator of bronchodilation and mucociliary activity
- 5-nitrosylheme (NO donors) can increase CFTR expression and maturation
- CF patients with higher NO production show enhanced pulmonary function

Potential benefits of Inhaled Nitric Oxide (NO) therapy in CF patients.

SUBJECTS & METHODS

We conducted a prospective open-label multi-center study to evaluate the safety and efficacy of inhaled NO (160ppm) in persistent NTM-CF patients.

Inclusion Criteria
- Exhaled NO (160ppm) ± SD
- 24 years of age
- Persistent NTM-CF
- Treatment regimen for NTM-CF 
- CFTR mutation (CFTR)

Exclusion Criteria
- NTM-CF patients on therapy
- NTM patients with M. abscessus infection (45%)

RESULTS

Fig. 1. Inhaled NO at 160ppm was safe and well tolerated by CF-NTM patients. No NO-related SAEs were reported. MetHb and NO2 levels remained within the accepted ranges (7% and 5ppm, respectively) after NO treatment. MetHb returned to baseline shortly after each NO treatment. Vital signs were stable.

Fig. 2. Inhaled NO (160ppm) improved 6MWD and Lung Function in CF-NTM patients. 6-min walk distance (6MWD) improved in 6 out of 9 CF-NTM patients treated with inhaled NO (left graph). Lung function measured by FEV1% improved in 5/9 treated patients (right graph). The mean values at the end of each treatment period are shown at the top of each bar.

CONCLUSION

- High-dose inhaled NO (160ppm) is safe and tolerable in CF patients.
- High-dose inhaled NO (160ppm) may improve lung function.
- Increase in sample size may achieve statistical significance in 6MWD improvement.
- High-dose inhaled NO may reduce bacterial burden in CF patients with M. abscessus and/or P. aeruginosa infection.
- Longer treatment duration (and/or higher dose) is warranted to improve the effect of inhaled NO therapy in CF-NTM-PD.

REFERENCES


ATS 2018
C96 mini-symposium: Advances in the Management of Pulmonary Disease
May 22 at 2:15-4:15pm