Airway hyperresponsiveness (AHR) assessment in mice is possible.

In comparison to a standard nebulization pattern, Pattern 6 produced similar changes in $R_1$ yet at much lower doses of Mch.

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TARGETED AIRWAY HYPERRESPONSIVENESS ASSESSMENT IN MICE

ABSTRACT

METHODS

EQUIPMENT

SCIREQ flexVent, first generation
In-line computer-controlled Airneb nebulizer (standard particle size, 4-6μm)

PROTOCOL

Naive male A/J mice
Anaesthetized, tracheostomized, mechanically ventilated
Increasing methacholine aerosol challenges
Ventilation during challenge:
Regular: 150 breaths/min, 10 mL/kg, 3 cm H2O/PEEP
Slow, deep: 30 breaths/min, 50 mL/kg, 3 cm H2O/PEEP

MEASUREMENTS

Broadband low frequency forced oscillation (1 - 20.5 Hz; Quick Prime-3).
Constant Phase Model Parameters: $R_1$ (airway resistance), $G$ (tissue damping), $H$ (tissue elastance).

NEBULIZATION PATTERNS

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Nebulization Time (s)</th>
<th>Nebulization Rate (%)</th>
<th>Ventilation during Nebulization</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10</td>
<td>50</td>
<td>Slow, deep</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
<td>50</td>
<td>Regular</td>
</tr>
<tr>
<td>3</td>
<td>2.5</td>
<td>50</td>
<td>Slow, deep</td>
</tr>
<tr>
<td>4</td>
<td>2.5</td>
<td>50</td>
<td>Regular</td>
</tr>
<tr>
<td>5</td>
<td>2.5</td>
<td>25</td>
<td>Slow, deep</td>
</tr>
<tr>
<td>6</td>
<td>2.5</td>
<td>25</td>
<td>Regular</td>
</tr>
</tbody>
</table>

RESULTS

MODIFIED VENTILATOR SETTINGS

COMPARATIVE MEASUREMENTS

BACKGROUND

- Airway hyperresponsiveness (AHR) assessment in mice using aerosolized methacholine is a procedure routinely performed in a large number of laboratories.
- Subtle protocol variations can be found in the literature.
- Modifications are often reported without systematic assessment of their impact.
- Varies nebulizer settings were previously reported to affect AHR in mice (1).

OBJECTIVE

- Evaluate the effect of varying ventilator settings during aerosol delivery on methacholine responsiveness in mice.

REFERENCES