Guidelines for Use of Inhaled Ribavirin

Aerosolized Ribavirin

Dosing & Monitoring Guidelines for Management of Respiratory Syncytial Virus Infection

Indications:
- Ribavirin aerosol is FDA-approved for the treatment of respiratory syncytial virus (RSV) infection in children. Although unapproved, there is some experience using the aerosol in immunocompromised adult populations (primarily hematopoietic stem cell transplant). Intravenous ribavirin has been studied for treatment of RSV pneumonia but is not commercially available in the US (only as an orphan drug for Korean hemorrhagic fever).

Dosing:
- FDA-approved dosing for aerosolized ribavirin in children involves 12-18 hours of continuous aerosol delivery. Recent studies using aerosolized ribavirin in adults have used high-dose, short-duration regimens that differ from the FDA-approved dosing and may be more practical for nursing care.

**Ribavirin Aerosol Dosing Strategies**

<table>
<thead>
<tr>
<th>Dosing</th>
<th>Total daily dose</th>
<th>Dose per interval</th>
<th>Dosage administration time and interval</th>
<th>Drug Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-dose, short-duration</td>
<td>6g</td>
<td>2g</td>
<td>2 hours every 8 hours</td>
<td>60mg/ml</td>
</tr>
<tr>
<td>FDA-approved</td>
<td>6g</td>
<td>6g</td>
<td>12-18 hours continuously</td>
<td>20mg/ml</td>
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</tr>
<tr>
<td>UCSF CRI protocol</td>
<td>6g</td>
<td>6g</td>
<td>6h continuously 12am-6am</td>
<td>60mg/ml</td>
</tr>
</tbody>
</table>

**Important considerations for ribavirin administration:**

- **Aerosolization:** aerosol ribavirin is designed for administration using the Valeant Small Particle Aerosol Generator (SPAG). The SPAG is designed to produce particles of appropriate size for deposition in appropriate lung areas for treatment of RSV infection. The SPAG can be connected to a facemask, an aerosol tent, or a ventilator. Special care should be used when attaching the SPAG to a mechanical ventilator to prevent drug precipitation and increased pulmonary pressures, including use of heated-wire connective tubing and frequent suctioning and tubing changes (2-4 hours).

- **Healthcare worker exposure minimization:** because of the potential teratogenicity of ribavirin (see below), exposure of healthcare workers to ribavirin should be minimized through the means such as: use of containment or scavenger systems; use of disposable respirator masks by healthcare workers; turning off SPAGs 5 minutes before healthcare worker exposure; and/or administration of aerosolized ribavirin in negative pressure rooms. Current data suggests exposure of healthcare workers caring for patients treated with aerosolized ribavirin is extremely low; nevertheless, pregnant women should avoid exposure to these patients if possible.

**Adverse effects and monitoring:**

- **Teratogenicity:** Although there are no documented adverse pregnancy outcomes in humans related to ribavirin exposure, sufficient evidence of teratogenicity in animal models exists for the FDA to classify ribavirin as pregnancy category X.

- **Bronchospasm:** Patients may experience bronchospasm during administration of aerosolized ribavirin. Scheduled, prophylactic administration of inhaled bronchodilators (e.g. albuterol q4h) may help prevent bronchospasm. Bronchospasm has also rarely been described in healthcare workers caring for patients receiving aerosolized ribavirin.

- **Psychological effects:** adults receiving prolonged treatment with aerosolized ribavirin in drug-scavenging tents may experience anxiety, loneliness, and isolation, sometimes necessitating discontinuation of therapy. High-dose/short-duration dosing, psychiatric
consultation, or temporary drug interruption should be considered to mitigate the psychological effects.

- **Anemia**: although anemia is a major adverse effect of ribavirin when it is orally administered, it has not been observed in patients receiving aerosolized ribavirin.

- **Other adverse effects**: rash, headaches, and conjunctivitis have been associated with aerosolized ribavirin use, but improve upon cessation of the drug. Contact lenses should not be worn during aerosol administration of ribavirin, as the drug may precipitate on them.

**References:**


Virazole prescribing information. Valeant Pharmaceuticals.