**Ribavirin**

*Classification*

Therapeutic: antivirals

Pharmacologic: nucleoside analogues

**Pregnancy Category:** C

**Indications**

Inhalation: Treatment of severe lower respiratory tract infections caused by the respiratory syncytial virus (RSV) in infants and young children. PO: Copegus— with interferon alfa-2b (*Intron A*) or peginterferon alfa-2b (*PegIntron*) in the treatment of chronic hepatitis C in patients with compensated liver disease. PO: Copegus— with peginterferon alfa-2a (*Pegasys*) in the treatment of chronic hepatitis C in patients with compensated liver disease who have not previously been treated with interferon alfa.

**Contraindications/Precautions**

Contraindicated in: Hypersensitivity; Patients receiving mechanically assisted ventilation; **OB, Lactation:** Pregnancy or lactation; **OB:** Male partners of pregnant patients; CCr < 50 mL/min; Significant/insoluble cardiovascular disease; Hemoglobinopathies; Autoimmune hepatitis or hepatic decompensation before or during treatment (for combined therapy with interferon alfa-2b or peginterferon alfa-2a); Concurrent use of didanosine, stavudine, or zidovudine.

**Use Cautiously in:** Sarcoidosis (may exacerbate condition); Anemia (dose reduction/discontinuation may be required); Any pre-existing cardiac disease; **OB:** Patients with childbearing potential; **Ped:** May result in growth.

**Adverse Reactions/Side Effects**

**Inhalation**

CNS: Dizziness, faintness.

EENT: Blurred vision, conjunctivitis, erythema of the eyelids, ocular irritation, photosensitivity.

CV: Cardiac arrest, hypotension.

Derm: Rash.

Hemat: Hemolytic anemia (with interferon alpha 2b), reticulocytosis.

**Oral (may reflect combination with interferon)**


EENT: Dry mouth, optic neuritis, papilledema, retinal artery/vein thrombosis, retinal detachment, retinal hemorrhage, retinopathy (with macular edema), visual abnormalities.


Hemat: Hemolytic anemia.


MS: Arthralgia (*p* in children).

Misc: Fever (*q* in children).

**Interactions**

**Drug-Drug**

Oral: May potentiate the antiretroviral action of stavudine and zidovudine. May potentiate the hematologic toxicity of zidovudine. May increase the risk of pancytopenia when used with azathioprine. May increase blood levels and risk of toxicity of didanosine. Although used together in the management of hepatitis, concurrent use with interferon alpha 2b risks hemolytic anemia.

**TIME/ACTION PROFILE (blood levels)**

<table>
<thead>
<tr>
<th>ROUTE</th>
<th>ONSET</th>
<th>PEAK</th>
<th>DURATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PO</td>
<td>Unknown</td>
<td>1.7–3 hr</td>
<td>12 hr</td>
</tr>
</tbody>
</table>

**Contraindicated in:** Hypersensitivity; Patients receiving mechanically assisted ventilation; **OB:** Pregnancy or lactation; **OB:** Male partners of pregnant patients; CCr < 50 mL/min; Significant/insoluble cardiovascular disease; Hemoglobinopathies; Autoimmune hepatitis or hepatic decompensation before or during treatment (for combined therapy with interferon alfa-2b or peginterferon alfa-2a); Concurrent use of didanosine, stavudine, or zidovudine.

Use Cautiously in: Sarcoidosis (may exacerbate condition); Anemia (dose reduction/discontinuation may be required); Any pre-existing cardiac disease; **OB:** Patients with childbearing potential; **Ped:** May result in growth.

Adverse Reactions/Side Effects

Inhalation

CNS: Dizziness, faintness.

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Hemat: Hemolytic anemia (with interferon alpha 2b), reticulocytosis.

Oral (may reflect combination with interferon)


MS: Arthralgia (*p* in children).

Misc: Fever (*q* in children).

Interactions

Drug-Drug: Oral: May potentiate the antiretroviral action of stavudine and zidovudine. May potentiate the hematologic toxicity of zidovudine. May increase the risk of pancytopenia when used with azathioprine. May increase blood levels and risk of toxicity of didanosine. Although used together in the management of hepatitis, concurrent use with interferon alpha 2b risks hemolytic anemia.
Route/Dosage

Inhaln (Infants and Young Children): 300 mL of 20 mg/mL solution delivered via mist for 12–18 hr/day.

Rebetol (with peginterferon alfa-2b [PegIntron])

If retreatment is necessary, duration of therapy is 48 wk, regardless of viral genotype

PO (Adults <105 kg): 600 mg in the morning, then 800 mg in the evening for 48 wk (viral genotype 1) or 24 wk (viral genotypes 2 and 3).

PO (Adults 81–105 kg): 600 mg in the morning, then 600 mg in the evening for 48 wk (viral genotype 1) or 24 wk (viral genotypes 2 and 3).

PO (Adults 66–80 kg): 400 mg in the morning, then 600 mg in the evening for 48 wk (viral genotype 1) or 24 wk (viral genotypes 2 and 3).

PO (Adults 65 kg): 400 mg in the morning, then 400 mg in the evening for 48 wk (viral genotype 1) or 24 wk (viral genotypes 2 and 3).

PO (Children 3–17 yr and <75 kg): 600 mg in the morning and 600 mg in the evening for 48 wk (viral genotype 1) or 24 wk (viral genotypes 2 and 3).

PO (Children 3–17 yr and 75–99 kg): 600 mg in the morning and 600 mg in the evening for 48 wk (viral genotype 1) or 24 wk (viral genotypes 2 and 3).

Copegus—viral genotype 1 or 2 (with peginterferon alfa-2a)

PO (Adults): 400 mg twice daily for 24 wk.

PO (Children 5 yr and 60–74 kg): 200 mg in the morning, then 200 mg in the evening for 24 wk.

PO (Children 5 yr and 47–59 kg): 200 mg in the morning, then 200 mg in the evening for 24 wk.

PO (Children 5 yr and 34–46 kg): 150 mg/kg/day in 2 divided doses (oral solution) for 24 wk.

PO (Children 5 yr and 23–33 kg): 150 mg/kg/day in 2 divided doses (oral solution) for 24 wk.

Renal Impairment

PO (Adults): CCr 30–50 mL/min—200 mg/day alternating with 400 mg/day every other day for 48 wk; CCr <30 mL/min or Hemodialysis—200 mg once daily for 48 wk.

Copegus—viral genotype 2 or 3 (with peginterferon alfa-2a)

PO (Adults): 600 mg twice daily for 24 wk.

PO (Children 5 yr and 75 kg): 600 mg in the morning, then 600 mg in the evening for 24 wk.

PO (Children 5 yr and 60–74 kg): 400 mg in the morning, then 600 mg in the evening for 24 wk.

PO (Children 5 yr and 47–59 kg): 400 mg in the morning, then 600 mg in the evening for 24 wk.

PO (Children 5 yr and 34–46 kg): 200 mg in the morning, then 200 mg in the evening for 24 wk.

PO (Children 5 yr and 23–33 kg): 200 mg in the morning, then 200 mg in the evening for 24 wk.
Cont.)

Ribavirin

Copegus—with HIV co-infection (regardless of viral genotype) (with peginterferon alfa-2a)

PO (Adults): 800 mg daily for 48 wk.

Nursing Implications

Assessment

RSV: Assess patient for infection (vital signs, rales, N/R) at beginning and during therapy.

Obtain pre-treatment cultures and sensitivity prior to initiating therapy. First dose may be given before receiving results.

Assess respiratory (lung sounds, adequacy of respirations) and fluid status prior to and frequently throughout therapy.

Chronic Hepatitis C: Monitor symptoms of hepatitis during therapy.

Assess patient for signs of depression during therapy. Monitor closely for neuropsychiatric changes, including suicidal ideation.

Obtain ECG prior to therapy in patients with pre-existing cardiac disease. Assess for cardiovascular disorders (pulse, BP, chest pain). Reduce dose or discontinue therapy if cardiac disorders occur. May cause myocardial infarction.

Assess for signs of colitis (abdominal pain, bloody diarrhea, fever) and pancreatitis (nausea, vomiting, abdominal pain) during therapy. Discontinue therapy if these occur; may be fatal.

Assess pulmonary status (lung sounds, respiration) periodically during therapy. May require discontinuation.

Monitor for hypersensitivity reactions (urticaria, angioedema, bronchoconstriction, anaphylaxis). Discontinue immediately and institute supportive therapy.

Lab Test Considerations: Chronic Hepatitis C: Monitor CBC with differential and platelet count prior to initiation, at week 2, and week 4, and periodically during therapy. If hemoglobin < 10 g/dL in patients with no history of cardiac disease or < 12 g/dL despite dose reduction in patients with history of stable cardiac disease; discontinuation therapy temporarily. If dose withheld in children, may restart with one-half original dose.

Monitor biochemical tests and electrolytes prior to, after 4 wks, and periodically during therapy.

Monitor liver function tests and phosphorus levels prior to and periodically during therapy.

Monitor prothrombin time prior to, monthly during, and 6 mo following discontinuation of therapy in women of childbearing age. Ribavirin should be started following negative conjugated estriol test.

May cause hepatic and uro-aciduria.

Potential Nursing Diagnoses

Risk for infection (Indications) (Side Effects)

Impaired gas exchange (Indications)

Implementation

Inhaln: Read the manufacturer’s instructions. Infants requiring assisted ventilation should be suctioned every 1–2 hr and pulmonary pressures monitored every 2–4 hr.

Ribavirin aerosol should be administered using the Viratek SPAG model SPAG-2 only. Do not administer via other aerosol generating devices. Usually administered using an infant oxygen hood attached to the SPAG-2 aerosol generator. Administration by facemask may be used if oxygen hood cannot be used.

Reconstitute vial with sterile water for injection or dilution. Transfer to clean, sterile bottle (3 ml) for injection or dilution. May cause serum bilirubin and uric acid levels.

Administer with food: Capsules should be swallowed whole; do not open, crush, or chew.

For children, determine if child is able to swallow 200 mg tablet.
Patient/Family Teaching

- **RSV**: Explain the purpose and route of treatment to the patient and parents.
- **Chronic Hepatitis C**: Instruct patient to take ribavirin at the same time each day for the full course of therapy. Take missed doses as soon as remembered. If total day dose is missed, notify health care professional; do not double doses. Emphasize the importance of routine lab tests to monitor for side effects.
- **Advisory Note**: Advise patient to brush teeth twice daily, have regular dental examinations, and rinse mouth thoroughly after vomiting to prevent dental and periodontal disease.

- **Blurred Vision**: Inform patient and parents that ribavirin may cause blurred vision and photosensitivity.

- **Liver Function**: Advise patient to take ribavirin at the same time each day for the full course of therapy. Take missed doses as soon as remembered. If total day dose is missed, notify health care professional; do not double doses. Emphasize the importance of routine lab tests to monitor for side effects.

- **Dental Hygiene**: Advise patient to brush teeth twice daily, have regular dental examinations, and rinse mouth thoroughly after vomiting to prevent dental and periodontal disease.

- **Drug Interactions**: May cause dizziness, confusion, fatigue, and drowsiness. Caution patient to avoid driving or other activities requiring alertness until response to medication is known.

- **Prescription Medication**: Inform patient that ribavirin may not reduce the risk of transmission of HCV to others or prevent cirrhosis, liver failure, or liver cancer.

- **Advisory Note**: Advise patient to consult health care professional before taking any other Rx, OTC, or herbal products.

- **Teratogenic Effects**: Instruct women with childbearing potential, and men, to use 2 forms of effective contraception during and for at least 6 months following conclusion of therapy. Men must use a condom. Avoid breast feeding during use.

**Evaluation/Desired Outcomes**

- **RSV**: Resolution of the signs and symptoms of RSV.
- **Hepatitis C**: Decreased progression and sequelae of chronic hepatitis C. Therapy with peginterferon alfa-2a and ribavirin should be discontinued if at least a 2 log reduction from baseline in HCV RNA by 12 weeks of therapy, or undetectable HCV RNA levels after 24 weeks of therapy.

Why was this drug prescribed for your patient?