Guidelines for the Use of Antiretroviral Agents in Pediatric HIV Infection

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**Table 15g. Antiretroviral Therapy-Associated Adverse Effects and Management Recommendations—Lactic Acidosis**

*Last updated April 16, 2019; last reviewed April 16, 2019*

<table>
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<th>Adverse Effects</th>
<th>Associated ARVs</th>
<th>Onset/Clinical Manifestations</th>
<th>Estimated Frequency</th>
<th>Risk Factors</th>
<th>Prevention/Monitoring</th>
<th>Management</th>
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<td>Lactic Acidosis</td>
<td>NRTIs: • ZDV; • Less likely with 3TC, FTC, ABC, TAF, and TDF</td>
<td>Lactic acidosis is associated with use of ddI and d4T. Cases are rare now that these NRTIs are no longer recommended.</td>
<td>Adult: Lactic acidosis generally, after years of exposure.</td>
<td>• Female sex • High BMI • Chronic HCV infection • African-American race • Co-administration of TDF with metformin • Overdose of propylene glycol</td>
<td>• Due to the presence of propylene glycol as a diluent, LPV/r oral solution should not be used in preterm neonates or any neonate who has not attained a postmenstrual age of 42 weeks and a postnatal age of ≥14 days.</td>
<td>Lactate 2.1–5.0 mmol/L (Confirmed with a Second Test): • Consider discontinuing all ARV drugs temporarily while conducting additional diagnostic workup. Lactate &gt;5.0 mmol/L (Confirmed With a Second Test) or &gt;10.0 mmol/L (Any One Test): • Discontinue all ARV drugs. • Provide supportive therapy (e.g., IV fluids; some patients may require sedation and respiratory support to reduce oxygen demand and ensure adequate oxygenation of tissues). Anecdotal (Unproven) Supportive Therapies: • Administer bicarbonate infusions, THAM, high doses of thiamine and riboflavin, oral antioxidants (e.g., L-carnitine, co-enzyme Q10, vitamin C) Following the resolution of clinical and laboratory abnormalities, resume therapy, either with a NRTI-sparing regimen or a revised NRTI-containing regimen. Institute a revised NRTI-containing regimen with caution, using NRTIs that are less likely to induce mitochondrial dysfunction (ABC, TAF, or TDF preferred; possibly FTC or 3TC). Lactate should be monitored monthly for ≥3 months.</td>
</tr>
</tbody>
</table>

**Other Drugs:**
- See Risk Factors and Prevention/Monitoring columns for information regarding the toxicity of propylene glycol when LPV/r oral solution is used in neonates.

**Insidious Onset of a Combination of Signs and Symptoms:**
- Generalized fatigue, weakness, and myalgias
- Vague abdominal pain, weight loss, unexplained nausea, or vomiting
- Dyspnea
- Peripheral neuropathy

**Note:** Patients may present with acute multi-organ failure (e.g., fulminant hepatic failure, pancreatic failure, respiratory failure).

**Key to Acronyms:**
- 3TC = lamivudine
- ABC = abacavir
- ARV = antiretroviral
- BMI = body mass index
- CD4 = CD4 T lymphocyte
- ddI = didanosine
- d4T = stavudine
- ddT = didanosine
- FTC = emtricitabine
- HCV = hepatitis C virus
- IV = intravenous
- LPV/r = lopinavir/ritonavir
- NRTI = nucleoside reverse transcriptase inhibitor
- TAF = tenofovir alafenamide
- TDF = tenofovir disoproxil fumarate
- THAM = tris (hydroxymethyl) aminomethane
- ZDV = zidovudine

*a* Blood for lactate determination should be collected, without prolonged tourniquet application or fist clenching, into a pre-chilled, gray-top, fluoride-oxalate-containing tube and transported on ice to the laboratory to be processed within 4 hours of collection.

*b* Management can be initiated before receiving the results of the confirmatory test.

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References

General Reviews


Risk Factors


Monitoring and Management


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