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

_Last updated April 14, 2020; last reviewed April 14, 2020_ (page 1 of 2)

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<th>Adverse Effects</th>
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<th>Onset/Clinical Manifestations</th>
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<td>Lactic Acidosis</td>
<td>NRTIs: ZDV</td>
<td>Onset: Generally after years of exposure</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>Adults: Female sex, High BMI, Chronic HCV infection, African-American race, Coadministration of TDF with metformin, Overdose of propylene glycol, CD4 count &lt;350 cells/mm³, Acquired riboflavin or thiamine deficiency, Possibly pregnancy</td>
<td>Prevention: 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>For Patients with Lactate 2.1–5.0 mmol/L (Confirmed with a Second Test): Consider discontinuing all ARV drugs temporarily while conducting additional diagnostic workup.</td>
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<td>Other Drugs: Less likely with 3TC, FTC, ABC, TAF, and TDF</td>
<td>Presentation: Lactic acidosis may be clinically asymptomatic. Lactic Acidosis May Also Present with 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</td>
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<td>Monitoring Asymptomatic Patients: Measurement of serum lactate is not recommended.</td>
<td>For Patients with Lactate &gt;5.0 mmol/L (Confirmed With a Second Test) or &gt;10.0 mmol/L (Any One Test): Discontinue all ARV drugs.</td>
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<td>Preterm Infants or Any Neonates Who Have Not Attained a Post-Menstrual Age of 42 Weeks and a Postnatal Age of ≥14 Days: Exposure to propylene glycol, which is used as a diluent in LPV/r oral solution. A diminished ability to metabolize propylene glycol may lead to accumulation, increasing the risk of adverse events.</td>
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<td>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)</td>
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Following the resolution of clinical and laboratory abnormalities, resume therapy, either with an 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, FTC or 3TC). Lactate should be monitored monthly for ≥3 months.
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.

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

Key: 3TC = lamivudine; ABC = abacavir; ARV = antiretroviral; BMI = body mass index; CD4 = CD4 T lymphocyte; d4T = stavudine; ddI = 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

References

General Reviews


Risk Factors


**Monitoring and Management**


