LACTIC ACIDOSIS by Mark Ramzy DO & Nick Mark MD

DEFINITIONS:
- **Lactic acid** is an endogenous substrate for gluconeogenesis, that is constantly produced by muscle and other tissues and is increased with exercise/activity. Lactic acid is non-toxic, though it can cause a metabolic acidosis and importantly can be a marker for severity of underlying disease.
- Lactate is the conjugate base of lactic acid (this is why LR does not cause acidosis).
- **Lactic Acidosis** is defined as an arterial lactate level ≥ 2 mmol/L PLUS a pH < 7.35.

ROLE IN DISEASE:
Lactic acid may be elevated in critical illness due to impaired O2 delivery (Type A lactic acidosis) or impaired O2 utilization by cells (Type B Lactic Acidosis). Rarely, an enantiomer of lactate (D-lactate) may be produced by gut bacteria in patients with bacterial overgrowth, causing another type of lactic acidosis. Elevation in serum lactate is associated with severe sepsis, but lactic acid clearance is unreliable as a resuscitation endpoint.

- In sepsis & septic shock, lactate elevations may be due to increased β² adrenergic tone rather than end-organ hypoperfusion.
- Septic patients with elevated lactate typically have hyperdynamic circulation & O2 delivery. Importantly, in severe sepsis increasing oxygen delivery (DO2) may not increase O2 consumption (VO2) nor does it affect lactate clearance.

**DEFINITIONS**
- **Clearance** is decreased in patients with bacterial overgrowth, causing another type of lactic acidosis.
- Rarely, an enantiomer of lactate (Lactatic acidosis) may be produced by gut bacteria in patients with bacterial overgrowth, causing another type of lactic acidosis.

**DEFINITIONS**
- **Impaired Clearance** is defined as an arterial lactate level ≥ 2 mmol/L PLUS a pH < 7.35.

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