Hyperchloremic metabolic acidosis: causes

**Definition**: A normal AG acidosis is characterized by a lowered bicarbonate concentration, which is counterbalanced by an equivalent increase in plasma chloride concentration, **AKA hyperchloremic metabolic acidosis.**

The term hyperchloremic acidosis (ie, RTA) refers to a diverse group of tubular disorders, uncoupled from glomerular damage, characterized by impairment of urinary acidification without urea and anion retention. Consequently, typically RTA is unaccompanied by significant decreases in GFR. These disorders can be divided into 2 general categories, proximal (type II) and distal (types I and IV).

| Mechanism | ↑AG | ↓AG |
|---|---|---|
| ↑acid production | Lactic acidosis<br>Ketoacidosis (DM, starvation, ETOH)<br>Ingestions (Methanol, Ethylene glycol, ASA, Toluene if early or kidney impaired, Diethylene glycol, Propylene glycol)<br>D-lactic acidosis<br>Pyroglutamic acid | Toluene if late and renal fx preserved |
| Loss of HCO3 | | Diarrhea or GI loss by tube drainage<br>Type 2 RTA<br>Post Rx of ketoacidosis<br>Carbonic anhydrase inhibitors<br>Ureteral diversion (ileal loop) |
| ↓renal acid excretion | CKD | CKD and tubular dysfx (but preserved GFR)<br>Type 1 RTA<br>Type 4 RTA (hypoaldosteronism) |

Characteristics of different types of RTA:

| | Type 1 RTA | Type 2 RTA | Type 4 RTA |
|---|---|---|---|
| Primary defect | ↓ distal acidification | ↓HCO3 prox reabsorb | ↓aldosterone secretion |
| Plasma HCO3 (meq/L) | Variable but gen < 10 | 12-20 | Variable but gen >17 |
| Urine pH | > 5.3 | variable | Variable |
| Plasma K | Usually ↓ | ↓ | ↑ |