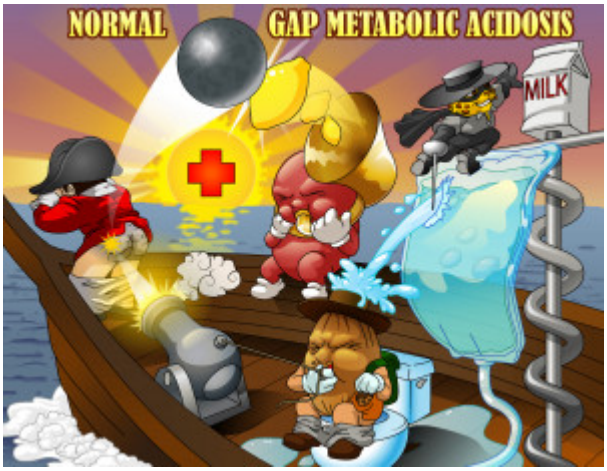
Normal Gap Metabolic Acidosis

Normal gap metabolic acidosis occurs when the body's pH drops below 7.4 but a normal anion gap is maintained between the sodium, chloride and bicarbonate concentrations. The calculation is made by subtracting the chloride and bicarbonate concentrations from the sodium concentration and seeing a value less than 11. This signifies that there is no other anion causing an acidosis. This type of metabolic acidosis is sometimes referred to as a hyperchloremic metabolic acidosis, described by either an increase in plasma Cl^- or a decrease in plasma bicorbonate. The common causes of normal gap acidosis can be remembered with the acronym HARD-ASS: hyperalimentation, Addison's disease, renal tubular acidosis, diarrhea, acetazolamide, spironolactone, or saline infusion.



PLAY PICMONIC

HARD-ASS

Hardass-captain with Stone-butt

HARD-ASS is the acronym describing causes of normal gap metabolic acidosis.

Hyperalimentation

Hiker-almond

Hyperalimentation in the form of overeating and Total Parenteral Nutrition (TPN) are causes for normal gap metabolic acidosis.

Addison's Disease

Add-sun

Addison's disease, where there is a loss of aldosterone, leads to metabolic acidosis because of decreased activity of the the H+/ATPase pump in the intercalated cells of the collecting duct. As hydrogen is not secreted, due to a lack of aldosterone, H+ is retained inside the cells and consequently causes blood acidemia.

Renal Tubular Acidosis

Kidney with Tuba and Acidic-lemon

Renal tubular acidosis is another cause of normal gap metabolic acidosis. There is an accumulation of acid in the body due to the inability of the kidneys to appropriately acidify the urine.

Diarrhea

Toilet

Diarrhea is a common cause of normal gap metabolic acidosis due to excessive loss of bicarbonate through the GI tract.

Acetazolamide

A Cheetah-Zorro

Carbonic anhydrase inhibitors, such as acetazolamide, cause loss of bicarbonate in the urine, which can lead to a normal gap metabolic acidosis.

Spironolactone

Spiral-of-milk

Spironolactone, which blocks aldosterone's effects on the distal tubule, can cause a normal gap metabolic acidosis. This is because a lack of aldosterone causes the sodium-hydrogen exchanger to waste sodium in the urine, leaving H+ in the serum.

Saline Infusion

Saline-sail

Normal gap metabolic acidosis can sometimes be caused by rapid infusion or sufficiently large volumes of plasma expanders, such as normal saline.