Hypokalemia

Definition:

- Serum <3.5mmol/L

Etiology:

- Intracellular shifts: Hypothermia, Exogenous insulin/refeeding, beta-agonists
- GI Potassium loss
  - Metabolic acidosis: diarrhea, laxative abuse
  - Metabolic alkalosis: Vomiting, NGT
- Renal Potassium Losses
  - Hypotensive or normotensive
    - Metabolic Acidosis: DKA, RTA type I and II
    - Metabolic Alkalosis: diuretic (thiazide > loop)
    - Drugs: amphotericin, cisplastin
    - Hypomagnesemia
  - Hypertensive: Mineralcorticoid excess

Evaluation:

Review medication list

Order basic labs: Serum BMP, Mg, Serum osmolality, urine electrolytes (Na, K, Cl), Urine osmolality

Distinguish renal from GI losses with urine potassium.

- Urine K/Cr >13 mEq: Renal loss ; Urine K/Cr <13mEq: extrarenal loss
- If inappropriately high urine potassium excretion, consider sending plasma renin activity and aldosterone level
- High renin: suggests diuretics, GI losses, renovascular disease
- Low renin and high aldosterone: primary aldosteronism
- Low renin and low aldosterone: non-aldosterone mineralcorticoid excess such as licorice ingestion

Severe hypokalemia, get an EKG. Changes include U wave, inverted T wave, ST depression, PR and QRS prolongation and can lead to Vfib.

Management: There is a replacement protocol that can be ordered. So the RN can replaced it based on the hospital protocol.

- Replete magnesium first if low
- Replete potassium to >3 or >4 if high risk (HTN, CHF, arrythymia, MI, cirrhosis)
- Supplementation can be given Oral or IV. Oral potassium replacement is first choice. Caution in patient with peptic ulcer disease. Higher doses can cause stomach upset.
- Suggested potassium replacement doses.
  - Serum K: 3.7-3.8: 20 mEq KCl IV or PO
  - Serum K: 3.5-3.6: 40 mEq KCl IV or PO
  - Serum K: 3.3-3.4: 60 mEq KCl IV or PO
  - Serum K: 3.1-3.2: 80 mEq KCl IV or PO
  - Serum K: less than equal 3.0: 100mEq KCl IV or PO

Caution in renal failure or ESRD. Always check the creatinine prior to replacing potassium. Give about half the suggested dose of potassium in patient with decreased GFR

Disorders of potassium homeostasis. Hypokalemia and hyperkalemia

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