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MEDICAL LABORATORY SCIENCE
MINERAL METABOLISM
BCH 204

Question →

Outline the toxicity values and deficiency manifestations of the following minerals.

- A) Potassium
- B) Calcium
- C) Magnesium
- D) Chloride
- E) Iron

1. Potassium: Toxicity Value

- A normal range of potassium is 2.6-5.2 millimoles per liter of blood
- A potassium level higher than 5.5 mmol/L is critically high
- over 6 mmol/L can be life-threatening

Deficiency Manifestations (Hypokalemia)

- weakness and fatigue
- muscle cramps
- muscle aches and stiffness
- tingles and numbness
- heart palpitation
- breathing difficulties
- digestive symptoms and mood changes

- Calcium: hypercalcemia (toxicity) → 10.4 and above (myeloma)
- deficiency →
- ~~tetany~~ muscle contraction (tetany)
- rickets in children
- cataract

alteration in the brain

Osteoporosis

Numbness and tingling in the hands, arms, feet, legs and around the mouth

Extreme fatigue

Hair and skin symptoms

magnesium

toxicity value: Normal Serum Magnesium conc range 0.75-0.95 mmol/L

anything above 0.95 mmol/L is considered higher than normal

Deficiency manifestations

loss of appetite

Nausea

Vomiting

fatigue and weakness

Numbness, tingling, muscle contractions and cramps, seizures

Personality change

Abnormal heart rhythm

Chloride:

toxicity value

Normal value for chloride is 97-106 mEq/L

anything greater than 106 mEq/L is considered toxic

deficiency manifestations

Burton syndrome

Burns

Congestive heart failure

Excessive sweating

Respiratory acidosis

Syndrome of inappropriate diuretic hormone secretion (SIADH)

5 Iron

Toxicity Value: levels above 350-500 $\mu\text{g/dl}$ are considered toxic

Deficiency manifestation

- anemia signs

- Extreme fatigue

- Weakness

- Pale skin

- Brittle nail

- Inflammation or soreness of your tongue

- Unusual craving for non-nutritive substance such as ice, dirt or starch.

- Poor appetite

- Cold hands and feet

- Chest pain, fast heartbeat or shortness of breath