18/mhs07/001

Pharmacology

Bch 204

Question: outline the toxicity values and deficiency manifestations of the following minerals:

- **Potassium**
- **Calcium**
- **Magnesium**
- **Chloride**
- **Iron**

Answer:

POTASSIUM: This is called hyperkalemia, or high potassium. a normal range of potassium is between 3.6 and 5.2 millimoles per liter (mmol/L) of blood. A potassium level higher than 5.5 mmol/L is critically high, and a potassium level over 6 mmol/L can be life-threatening.

DEFICIENCY MANIFESTATION:

- Fatigue
- Muscle cramps
- Muscle aches and stiffness
- Tingles and numbness
- Heart palpitation
- Breathing difficulties
- Mood changes
- Digestive symptoms.

CALCUIM: The Toxic Condition of Hypercalcemia and Hypercalciuria

Hypercalcemia occurs when serum calcium levels are 10.5 mg/dL (also expressed as 2.63 mmol/L) or greater depending on normative laboratory values

DEFICIENCY MANIFESTATION:

- Fainting
- Difficulty swallowing
- Numbness
- Weak and brittle finger nails
- Poor appetite
- Lethargy
- Muscle cramps

- Tingling fingers
- Osteopenia and osteoporosis
- Bone fracture
- Growth and development delay in children
- Heart problem involving blood pressure and hearth ryhthm
- Tooth erosion
- Insufficient blood clotting
- Mental confusion, irritability, depression, and anxiety.

MAGNESIUM: Hypomagnesemia is defined as a serum magnesium level less than 0.75 mmol/L .Magnesium homeostasis is largely controlled by the kidney, which typically excretes about 120 mg magnesium into the urine each day.

DEFICIENCY MANIFESTATION:

- Muscle twitches and cramps
- Hypomagnesemia
- Mental disorder
- Fatigue and muscle weakness
- High blood pressure
- Asthma
- Irregular heart beat
- Osteoporosis
- Diabetes
- Coronary heart disease.

CHLORIDE: At approximately 40–60 ppm, a toxic pneumonitis and/or acute pulmonary edema can develop. Concentrations of about 400 ppm and beyond are generally fatal over 30 minutes, and at 1,000 ppm and above, fatality ensues within only a few minutes

DEFICIENCY MANIFESTATION:

- Fluid loss
- Hypochloremia
- Dehydration high level of blood sodium(may be noted)
- Pro longed diarrhoea
- Frequent vomiting
- Breathing problem
- High blood pressure
- Excessive fatigue

IRON: Toxic effects begin to occur at doses above 10–20 mg/kg of elemental iron. Ingestions of more than 50 mg/kg of elemental iron are associated with severe toxicity. In terms of

blood values, iron levels above 350–500 µg/dL are considered toxic, and levels over 1000 µg/dL indicate severe iron poisoning

DEFICIENCY MANIFESTATION:

- Pale skin
- Fatigue/ lack of energy
- Shortness of breath or chest pain
- Anemia
- Headache, dizziness, or lightheadedness
- Cool hands and feet
- Brittle nails
- Inflammation or soreness of tongue
- Poor appetite especially in infants. And children with anemia
- Unusual cravings for non- nutritive substances such as ice, dirt or starch.