18/mhs07/022

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.

• 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 rhythm.

• 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 diarrhea.

• 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.

• 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.