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Course Title: Medical Biochemistry II

Assignment

Outline the toxicity values and deficiency manifestations of the following materials

1. Potassium
2. Calcium
3. Magnesium
4. Chloride
5. Iron

## 1. Potassium

Toxicity values- 5.5mmol/L

### Deficiency Manifestation

Hypokalemia: Low level of potassium in ones blood.

Symptoms include;

- Weakness of the muscles
- Muscle pain
- Numbness
- Palpitations.

Causes include;

- Vomiting,
- Diarrhea
- Hypomagnesmia
- Not taking enough in the diet
- Skin loss etc.

Treatment;

- Oral potassium supplementation
- Intravenous potassium replacement
- Potassium sparing diuretics

## 2. Calcium

Toxicity value- 2.63mmol/L

### Deficiency Manifestation

Hypocalcemia: Results primarily from medical problems or treatments, including renal failure, surgical removal of stomach.

Symptoms;

- Muscle Problems

- Extreme fatigue (Can cause insomnia or sleepiness)
- Nail and skin symptoms
- Osteopenia and osteoporosis
- Painful premenstrual syndrome
- Dental problem
- Depression

Complications;

- Seizures
- Disability
- Fracture

The treatment and way to prevent hypocalcemia is to add more calcium to diet.

### 3. Magnesium

Toxicity value\_ 1.74-2.61mmol/L

Deficiency Manifestation

Hypermagnesemia: Is an electrolyte disorder in which there is a high level of magnesium in the blood. It is also caused by kidney failure

Symptoms;

- Confusion
- Weakness
- Decreased reflexes
- Decreased breathing rate

Complications;

- Low blood pressure
- Cardiac arrest

Treatment;

By stopping the magnesium the person is getting. Treatment when level are very high include calcium chloride, furosemide etc.

#### 4. Chloride

Toxicity value\_ 97-107mEq/L

Deficiency manifestation

- a. Hypochloremia: Is an electrolyte imbalance and is indicated by a low level of chloride in the blood.

Causes of Hypochloremia:

- Loss of body fluids from prolonged vomiting, diarrhea, sweating or high fevers.
- Drugs such as: bicarbonate, corticosteroids, diuretics, and laxatives.

Symptoms of Hypochloremia:

- Many people do not notice any symptoms, unless they are experiencing very high or very low levels of chloride in their blood.
- Dehydration, fluid loss, or high levels of blood sodium may be noted.
- You may be experiencing other forms of fluid loss, such as diarrhea, or vomiting.

- b. Hyperchloremia: Is a disorder in which a person has too much chloride in their blood. Chloride is an electrolyte, and changes in electrolyte levels can cause dehydration.

Symptoms;

- muscle weakness, spasms, or twitches
- irregular heart rate
- confusion, difficulty concentrating, and personality changes

- numbness or tingling
- seizures and convulsions

Causes;

- Dehydration due to medications, intense exercise, heat exposure, or not drinking enough fluids.
- High sodium levels in the blood. Chloride tends to rise when sodium does.
- Too much salt intake
- Some medications, particularly hormones, diuretics, and corticosteroids, such as hydrocortisone.
- Starvation due to eating disorders, severe malnourishment, or problems absorbing nutrients from food.

Treatment;

- taking medications to prevent nausea, vomiting, or diarrhea
- changing drugs if they are a factor in the electrolyte imbalance
- drinking 2–3 quarts of fluid every day
- receiving intravenous fluids
- eating a better, more balanced diet

## 5. Iron

Toxicity Value\_ 350-500 $\mu$ g/dL

Deficiency manifestation

Anemia: a condition in which blood lacks adequate healthy red blood cells.

Signs and symptoms;

- Extreme fatigue
- Weakness
- Pale skin
- Chest pain, fast heartbeat or shortness of breath
- Headache, dizziness or lightheadedness
- Cold hands and feet
- Inflammation or soreness of your tongue
- Brittle nails
- Unusual cravings for non-nutritive substances, such as ice, dirt or starch
- Poor appetite, especially in infants and children with iron deficiency anemia

#### Complications;

- Heart Problems
- Problems during pregnancy
- Growth problem

#### Causes;

- Blood loss
- A lack of iron in ones diet
- Inability to absorb iron

#### Risk factor;

- Women
- Infants and children
- Vegetarians

#### Prevention;

- Choose iron rich food such as Red meat, pork and poultry, sea food, Beans, Peas.
- Choose food containing vitamin C