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Assignment:

1. OUTLINE THE TOXICITY VALUES AND DEFICIENCY MANIFESTATIONS OF THE FOLLOWING MINERALS

A. POTTASIIUM

B. CALCIUM

C. MAGNESSIUM

D. CHLORIDE

E. IRON

1. Deficiency manifestation of potassium include:

- a. Weakness and fatigue
- b. Muscle cramps and spasms
- c. Digestive problems
- d. Heart palpitations
- e. Muscle aches and stiffness
- f. Tingling and numbness
- g. Breathing difficulties
- h. Mood changes

ii. Toxicity value of potassium:

Hyperkalemia: 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.

2. Deficiency manifestation of Iron include;

- a. Extreme fatigue
- b. Brittle nails
- c. Pale skin
- d. Weakness
- e. Chest pains, shortness of breath
- f. Cold hands and feet
- g. Inflammation or soreness of the tongue.

ii. Toxicity of value of 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.

3. Deficiency manifestation of Calcium include:

Minor calcium deficiency symptoms can include:

- Numbness.
- Tingling Fingers.
- Muscle cramps.
- Lethargy.
- Poor appetite.
- Weak or brittle fingernails.
- Difficulty swallowing.
- Fainting.

Toxicity value of calcium:

Excess calcium intake from foods alone is difficult if not impossible to achieve. Rather, excess intakes are more likely to be associated with the use of calcium supplements. However, the potential indicators for the adverse outcomes of excessive calcium intake are not characterized by a robust data set that clearly provides a basis for a dose–response relationship. The measures available are confounded by a range of variables including other dietary factors and pre-existing disease conditions.

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. It can be induced by excess intake of calcium or vitamin D, but it

is more commonly caused by conditions such as malignancy and primary hyperparathyroidism (Moe, 2008). Clinical signs and symptoms of hypercalcemia may vary depending on the magnitude of the hypercalcemia and the rapidity of its elevation; they often include anorexia, weight loss, polyuria, heart arrhythmias, fatigue, and soft tissue calcifications

4. Deficiency manifestations of chloride:

Hypochloremia is an **electrolyte imbalance** and is indicated by a low level of chloride in the blood. The normal adult value for chloride is 97-107 mEq/L.

Chloride in your blood is an important electrolyte and works to ensure that your body's metabolism is working correctly. Your kidneys control the levels of chloride in your blood. Therefore, when there is a disturbance in your blood chloride levels, it is often related to your kidneys. Chloride helps the acid and base balance in the body.

Toxicity value of chloride:

A normal adult human body contains approximately 81.7 g chloride. On the basis of a total obligatory loss of chloride of approximately 530 mg/day, a dietary intake for adults of 9 mg of chloride per kg of body weight has been recommended (equivalent to slightly more than 1 g of table salt per person per day). For children up to 18 years of age, a daily dietary intake of 45 mg of chloride should be sufficient. A dose of 1 g of sodium chloride per kg of body weight was reported to have been lethal in a 9-week-old child.

Chloride toxicity has not been observed in humans except in the special case of impaired sodium chloride metabolism, e.g. in congestive heart failure. Healthy individuals can tolerate the intake of large quantities of chloride provided that there is a concomitant intake of fresh water. Little is known about the effect of prolonged intake of large amounts of chloride in the diet. As in experimental animals, hypertension associated with sodium chloride intake appears to be related to the sodium rather than the chloride ion.

5. Deficiency manifestation of magnesium:

Magnesium deficiency, also known as hypomagnesemia, is an often overlooked health problem. Health problems associated with magnesium loss include diabetes, poor absorption, chronic diarrhea, celiac disease and hungry bone syndrome. People with alcoholism are also at an increased risk

They include:

- Muscle cramps and twitches
- Mental disorders

- Osteoporosis
- Fatigue and muscle weakness
- High blood pressure

Toxicity value of magnesium:

An adult body contains approximately 25 g magnesium, with 50% to 60% present in the bones and most of the rest in soft tissues. Less than 1% of total magnesium is in blood serum, and these levels are kept under tight control. Normal serum magnesium concentrations range between 0.75 and 0.95 millimoles (mmol)/L [1,5].

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. Urinary excretion is reduced when magnesium status is low