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**MATRIC NO: 18/MHS05/009**

**DEPARTMENT: PHYSIOLOGY**

**COLLEGE: MHS**

**COURSE: BCH 204**

**QUESTIONS:**

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

A. POTASSIUM

B. CALCIUM

C. MAGNESSIUM

D. CHLORIDE

E. IRON

**ANSWERS:**

1. **POTASSIUM:**

**TOXICITY VALUES:** If you have hyperkalemia, you have too much potassium in your blood. The body needs a delicate balance of potassium to help the heart and other muscles work properly. But too much potassium in your blood can lead to dangerous, and possibly deadly, changes in heart rhythm.

**DEFICIENCY MANIFESTATION:** this is due to low level of potassium in the blood which causes **HYPOLAKEMIA.**

1. **CALCIUM:**

**TOXICITY VALUES:** calcium toxicity is rare, occurring in those with hyperparathyroidism or high **calcium** supplementation levels. Like vitamin D, **toxicity** can lead to calcification of soft tissues7. In addition, a very high intake of **calcium** can lead to kidney stone formation

**DEFICIENCY MANIFESTATION:**

* **HYPERCALCEMIA:** when the calcium level is more than 11mg/dl. The major cause is **hyperparathyroidism.**
* **HYPOCALCEMIA:** when the serum calcium level is less than 8.8 mg/dl.

1. **MAGNESIUM:**

**TOXICITY VALUES:** The toxic effects of magnesium are inherently linked to the levels (mEq/liters) found in the serum. As the levels of magnesium rise, different symptoms start to manifest, and the fatality of those symptoms is proportional to the levels of magnesium found. Starting at 5 to 10 mEq/L, patients will begin to develop ECG changes (prolonged PR interval, widened QRS). At 10 mEq/L, there will be a loss of deep tendon reflexes and muscle weakness. At 15 mEq/L, signs of abnormal conductivity surface as SA/AV node block. Additionally, patients begin to experience respiratory paralysis. At 20 mEq/L or higher, the patient is likely to experience cardiac arrest

**DEFICIENCY MANIFESTATIONS:**

* **HYPOMAGNESEMIA:**

an electrolyte disturbance in which there is a low level of magnesium in the body. It can result in multiple symptoms. Symptoms include; tremor, poor coordination, muscle spasms, loss of appetite, personality changes, and nystagmus.

1. **CHLORIDE:**

**TOXICITY VALUES:** 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.

**DEFICIENCY MANIFESTATIONS:**

* **HYPOCHLOREMIA:**  Hypochloremia occurs when there's a low level of chloride in your body. It can be caused by fluid loss through nausea or vomiting or by existing conditions, diseases, or medications. Your doctor may use a blood test to confirm hypochloremia.

1. **IRON:**

**TOXICITY VALUES:**

* **Hemosiderosis:** excess iron in the body.
* **Primary hemosiderosis:** also known as hemochromatosis. It is an autosomal recessive condition.
* **Iron vessels:** cooking in iron vessels increases the availability of iron.
* **Bantu siderosis:** Bantu tribe in Africa is prone to hemosiderosis because the staple diet, corn, is low in phosphate content.
* **Hemochromatosis:** in the liver, hemosiderin deposit leads to death cells and cirrhosis. Pancreatic cell death leads to diabetes. Deposits under the skin cause yellow-brown discoloration, which is called **hemochromatosis**. The triad of cirrhosis, hemochromatosis and diabetes are referred to as **bronze diabetes.**

**DEFICIENCY MANIFESTATIONS:**

* **IRON ANAEMIA:** When there is little iron in the body which is as a result of reduced amount of haemoglobin in the cell.