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**DEPARTMENT; HUMAN ANATOMY**

**COURSE TITLE; MEDICAL BIOCHEMISTRY**

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**ASSIGNMENT TITLE; MINERAL METABOLISM**

**Question**

* **Outline the toxicity values and deficiency manifestation of the following minerals**
* **Potassium**
* **Calcium**
* **Magnesium**
* **Chloride**
* **Iron**

**Potassium**

**Potassium clearly has its potential for risks including life- threatening hyperkalaemia and cardiac arrest. It is very concerning that the slow – release preparation is available in bottles of 100 without prescription**

**Like all metals ingestion they are direct GI irritant . once intracellular potassium interferes with electrical conduction in both nerves and muscle resulting in cardiac arrest**

**DEFICIENCY MANIFESTATION**

1. **Weakness and fatigue**

**Since potassium helps regulate muscle contraction, deficiency may result in weaker contraction. Also some evidence shows that a deficiency may impair the body’s handling of nutrients like sugar, which may lead to fatigue**

1. **Muscle cramps and spasms**

**Potassium helps starts and stop muscle contraction. Low blood potassium levels can affect this balance, causing uncontrolled and prolonged contractions known as cramps**

1. **Digestive problem**

**Potassium deficiency may cause problem like bloating and constipation because it can slow the movement of food through the digestive system. Some evidence shows that severe deficiency can paralyze the gut, but it’s not completely clear**

1. **Heart palpitations**

**Potassium helps regulate the heartbeat, and low levels may cause symptoms like heart palpitation**

1. **Muscle aches and stiffness**

**Muscle aches and stiffness can be another sign of potassium deficiency and are caused by rapid muscle and breakdown (rhabdomyolysis)**

**CALCIUM**

**Calcium toxicity is rare, occurring in those with hyperparathyroidism or high calcium supplementation**

**levels. Like vitamin D toxicity can lead to calcification of soft tissues. In addition, a very high intake of calcium can lead to kidney stone formation**

**DEFICIENCY MANIFESTATION**

1. **Numbness**
2. **Tingling cramps**
3. **Muscle cramps**
4. **Lethargy**
5. **Poor appetite**
6. **Weak or brittle fingernails**
7. **Difficulty swallowing**
8. **Fainting**

**MAGNESSIUM**

**Magnesium toxicity which usually develop after serum concentrations exceed 1.74-2.61mmol/l, can include hypotension,nausea,vomiting,facial flushing, retention of urine,ileus,depression and lethargy before progressing to muscle weakness, difficulty breating,extreme hypotension, irregular heartbeat.**

**DEFICIENCY MANIFESTATION**

**1. Neuromuscular hyperexcitability**

**2. Cardiac arrhythmias**

**3. Biochemical abnormalities of hypokalemia and hypocalcaemia**

**CHLORIDE**

**Chloride toxicity has not yet been observed in human except in the special case of impaired sodium chloride metabolism, e.g. in congestive heart failure**

**DEFICIENCY MANIFESTATION**

1. **Excessive fatigue**
2. **Muscle weakness**
3. **Breathing problem**
4. **Frequent vomiting**
5. **Prolonged diarrhea**
6. **Excessive thirst**
7. **High blood pressure**

**IRON**

**Iron toxicity happens when the body has too much iron. The most common cause of iron toxicity is accidental overdose of iron pills**

**DEFICIENCY MANIFESTATION**

**1. Unusual tiredness**

**2. Paleness**

**3 .shortness of breath**

**4. Headaches and dizziness**

**5 .heart palpitation**

**6 .dry damaged hair and skin**

**7. Swelling and soreness of tongue and mouth**

**8 .restless legs**

**9 .brittle or spoon- shaped fingernails**

**10. Other potential signs**