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**MATRIC NUMBER: 19/MHS03/015**

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**TOXICITY VALUES AND DEFICIENCY MANIFESTATIONS**

1. **POTASSIUM**

The normal level of potassium in the bloodstream is in the range of 3.5–5.0 mM, while levels of 6.3–8.0 mM (severe hyperkalaemia) result in cardiac arrhythmias or even death due to cardiac arrest. Potassium is potentially quite toxic; however, potassium poisoning is usually prevented because of the vomiting reflex. The consumption of food results in mild increases in the concentration of potassium in the bloodstream, but these levels of potassium do not become toxic because of the uptake of potassium by various cells of the body as well as by the action of the kidneys transferring the potassium ions from the blood to the urine. The body's regulatory mechanisms can easily be overwhelmed, however, when potassium chloride is injected intravenously, as high doses of injected potassium can easily result in death.

Potassium deficiency is usually associated with sodium deficiency and both are associated with dehydration stemming from excessive losses of body fluid.

1. **CALCUIM**

Calcium and phosphate: Calcium and phosphate are closely related nutrients. Calcium toxicity is rare, but overconsumption of calcium supplements may lead to deposits of calcium phosphate in the soft tissues of the body. Phosphate toxicity can result from the overuse of laxatives or enemas that contain phosphate. Severe phosphate toxicity can result in hypocalcaemia and in various symptoms resulting from low plasma calcium levels. Moderate phosphate toxicity occurring over a period of months may result in the deposit of calcium phosphate crystals in various tissues of the body.

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.

Calcium deficiency due to lack of dietary calcium occurs only rarely and is often due to vitamin D deficiency, because vitamin D is required for efficient absorption of dietary calcium. Significant depletion of calcium stores can lead to osteoporosis.

1. **MAGNESSIUM**

Symptoms of magnesium toxicity, which usually develop after serum concentrations exceed 1.74–2.61 mmol/L, can include hypotension, nausea, vomiting, facial flushing, retention of urine, ileus, depression, and lethargy before progressing to muscle weakness, difficulty breathing, extreme hypotension, irregular heartbeat

Magnesium deficiency

Dietary magnesium deficiency is rare because the mineral is found in nearly all foods, but it can occur through poor diet or in malnutrition or result from excessive losses due to severe diarrhoea or vomiting. Symptoms of magnesium deficiency include faulty transmission of nerve and muscle impulses, irritability, nervousness, and tantrums. Confusion, poor digestion, rapid or irregular heartbeat (arrhythmia), and seizures can also result. Magnesium deficiency is associated with cardiac arrest, asthma, chronic fatigue syndrome, chronic pain, depression, insomnia, irritable bowel syndrome, and lung conditions.

1. **CHLORIDE**

chloride levels not to exceed 250 mg/l. An increased level of blood chloride (called hyperchloremia) usually indicates dehydration, but can also occur with other problems that cause high blood sodium, such as Cushing syndrome or kidney disease

Hypochloraemia occurs when there's a low level of chloride in your body. It can be caused by fluid loss through nausea or vomiting

1. **IRON**

Iron toxicity is not unusual in small children due to the wide distribution of dietary supplements containing iron. A lethal dose of iron is in the range of 200—250 mg iron/kg body weight, meaning that a child who accidentally eats 20 or more iron tablets may die as a result of iron poisoning. Children are unfortunately likely to take large amounts of these pills because they look like candy. Within six hours of ingestion, iron toxicity can result in vomiting, diarrhoea, abdominal pain, seizures, and possibly coma. In the second period of iron poisoning, the patient's symptoms appear to improve; however, this phase is followed by a terminal phase in which shock, low blood sugar levels, liver damage, convulsions, and death occur 12 to 48 hours after the fatal dose.

Iron deficiency causes anaemia (low haemoglobin and reduced numbers of red blood cells), which results in tiredness and shortness of breath because of poor oxygen delivery.