

PaLMS (PATHOLOGY NORTH) TRACE ELEMENTS FACT SHEET

ZINC

Introduction

Atomic mass 65.4, zinc is extremely important in providing the catalytic activity of many enzymes. In fact there are more than 300 zinc metalloenzymes. Additionally, zinc atoms have structural roles in many proteins, for instance the zinc finger motif that is very common in transcription factors.

Pathology

Situations in which zinc deficiency may occur include:

- Pancreatic disease or insufficiency
- Malabsorption syndromes
- Inadequate diet: anorexia, protein-calorie malnutrition, alcoholism
- TPN with diarrhoea or inflammatory bowel disease

Dramatic loss of zinc may occur during catabolic processes, surgical procedures or severe infections.

Strict vegetarians may need as much as 50% more zinc per day, because of the increased phytic acid and fibre in their diet.

Acrodermatitis enteropathica is a rare, autosomal, recessive inherited defect of zinc absorption.

The clinical manifestations of zinc deficiency may be quite varied and non-specific, reflecting the wide range of functions zinc performs:

- Impaired growth velocity
- Delayed sexual maturation
- Impotence
- Hypogonadism
- Oligospermia
- Alopecia
- Anorexia
- Diarrhoea
- Dysgeusia (impaired taste)
- Immune dysfunction
- Night blindness
- Impaired wound healing
- Depression
- Various skin lesions (acro-oral dermatitis, erythematous, vesiculobullous and pustular lesions)

Zinc toxicity is rare. It may occur from ingestion of zinc-contaminated food. Clinical features may include abdominal pain, diarrhoea, nausea and vomiting. Chronic high-dose zinc supplementation can lead to secondary copper deficiency.

Monitoring

Plasma zinc provides a convenient, but limited, marker of zinc status. Hypoalbuminaemia, the acute-phase response, steroid therapy (including oral contraceptive pill use) and pregnancy will lower plasma zinc independently of zinc status. However, concentrations below 7µmol/L indicate marked deficiency.

Analysis

Trace Elements analyses zinc using inductively coupled plasma mass spectrometry.

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