

REVIEW

DEFICIENCY AND TOXICITY OF VITAMINS

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Abstract: Vitamins are substances necessary to sustain life, with many functions. Vitamins must be obtained from food, as they are either not made in the body at all or are not made in sufficient quantities for growth, vitality and wellbeing. Lack of a particular vitamin can lead to incomplete metabolism, fatigue and other important health problems. Deficiency of a vitamin causes symptoms which can be cured by that vitamin. Large doses of vitamins may slow or ever reverse diseases such as cancer, osteoporosis, nerve degeneration and heart disease.

Keywords: vitamins, deficiency, excess, water-soluble vitamins, fat-soluble vitamins.

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Abbreviations: ACP-acyl carrier protein CRP- C-reactive protein; DRI-dietary reference intake; GPX-3-Glutathione peroxidase 3; G6PD-Glucose-6-phosphate dehydrogenase; EAR-estimated average requirement; Holo-TC-holo-transcobalamin; HPLC-high-pressure liquid chromatography; MMA-methylmalonic acid; NAD-nicotinamide adenine dinucleotide; RDA-recommended dietary allowance; ThDP-thiamine diphosphate; VKDp -vitamin K dependent-proteins.

INTRODUCTION

Vitamins are substances which are necessary to sustain life. They are divided in water-soluble vitamins (B-complex) and fat-soluble vitamins (vitamin A, vitamin D, vitamin K and vitamin E). Vitamins are essential for the normal function of human body metabolism. They play a role in metabolism enabling the body to use other essential nutrients such as carbohydrates, fats, proteins and minerals. Individual vitamins have specific functions which vary widely and can overlap. They are involved in growth and the maintenance of health and are

important for a normal appetite, in digestion and resistance to bacterial infections. It is important to understand that vitamins are not substitutes for food.

THIAMINE (VITAMIN B1)

Thiamine is a water-soluble vitamin essential for carbohydrate metabolism and energy metabolism [1]. Body stores of thiamine are limited and dependent on dietary intake. There are five natural thiamine phosphate derivatives.

The absorption of vitamin B1 occurs in the jejunum and ileum and it can be inhibited by