Editorial

Calcium: Its role in human health and diseases

Calcium is an important nutrient in human body. The total amount of calcium in the adult human is about 1.1 kg (27.5 mol).[1] It is the major constituent of the bones and teeth where 99% of total body calcium is distributed. The rest 1% is found in free and bound forms inside and outside the cells throughout the body. The concentration of calcium in plasma is (2.1-2.6 mmol/L i.e 8.5mg to10.5 mg/dl). The concentration of ionized calcium is (1.1-1.3 mmol/L) and the physiological action of calcium is mediated by ionized calcium[1]. Calcium regulating hormones such as parathyroid hormones or parathormone, calcitonin and 1, 25 dihydroxy cholecalciferol (active form of vitamin D) play an important role in the maintenance of plasma calcium concentration.

Calcium as an important nutrient involved in many body functions such as signal transduction, neuromuscular excitability, exocytosis, muscle contraction, vascular contraction, hormonal secretion, formation of bone and teeth and acts as a second messenger. It is observed that calcium absorption occurs along the whole length of small intestine and colon particularly in the upper part of small intestine .[2] A total of 30-80% of ingested calcium is absorbed and Ca^{2+} absorption is facilitated by protein and active form of vitamin D whereas it is inhibited by phosphate, oxalate[3] and glucocorticoids.[2]

Ca^{2+} absorption is adjusted to body needs. Absorption is increased in Ca^{2+} deficiency and decreased in Ca^{2+} excess. It is necessary to take required amount of calcium to maintain many important body functions. The daily requirement of calcium varies according to different age and different condition of the body. The daily requirement of calcium for the children is 800-1200 mg whereas for the adult is about 700-800 mg. The daily requirement of calcium for women during pregnancy and lactation is about 1200 mg.

To take adequate calcium it is also necessary to know the food which contains high concentration of calcium. The food which contains high concentration of calcium includes vegetables: [(Red Amaranthus i.e.Lal Shak, kachu shak, Amaranthus i.e. Data Shak, Callaloo i.e.Pui Sak and beans], Fruits [Apple, Amloki, Tamarind, Guava, Mango, Wood apple i.e. Bel], Fish [Walking cat fish i.e Magur fish, Stinging cat fish i.e sing fish, Rui fish, Dried fish (Shutki)], Meats, Milk, cereals and in oils [Mustard oil and sesame (Til oil].

It has been reported that adequate calcium intake can reduce the risk of fracture, osteoporosis, diabetes and obesity.[4,5,6,7]

Post menopausal women, individuals with milk allergy or lactose intolerance, adolescents and elderly are identified as higher risk groups for dietary calcium deficiency.[8,9,10]

Calcium deficiency may progress with age due to less exposure to sun light, poor dietary habit and progressive loss of kidney tissue (prolonged kidney disease), decrease formation of active form of vitamin D and steatorrhoea.

It is necessary to maintain normal blood calcium level for many body functions as already mentioned. Any deviation from normal blood calcium level may result many diseases. Hypocalcaemia may result in diseases like osteoporosis, hypertension, arteriosclerosis, myocardial infarction, diabetes mellitus, neurodegenerative disease, myocardial infarction and tetany.[12] On the other hand hypercalcaemia may leads to peptic ulcer, lack of appetite, abdominal pain, constipation, sluggish reflex activity of CNS, depressed relaxation of heart during diastole and parathyroid poisoning.[12]

Therefore, it is expected that everybody should be aware of the importance of calcium which is involved in many body functions and give emphasis to take adequate calcium intake in the diet to prevent many diseases and live a healthy life.

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