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Address:-Ashok Yakkaldevi 258/34, Raviwar Peth, Solapur - 413 005 Maharashtra, India
Cell : 9595 359 435, Ph No: 02172372010 Email: ayisrj@yahoo.in Website: www.isrj.org

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MICRONUTRIENTS AND ATHLETIC PERFORMANCE

Jeetendra Kumar Gupta
Assistant. Professor, Department of Physical Education (B.P.Ed),
Ganpat Sahai P.G. College, Sultanpur (U.P.).

Co - Author Details :

Varsha Gupta
M.Sc. Department of Chemistry, Dr. R.M.L. Awadh University, Faizabad (U.P.)

ABSTRACT

Micronutrients are vitamins and minerals required in small amounts that are essential to human health, development and growth. Micronutrients play crucial roles in athlete's performance, including the prevention and treatment of various diseases and conditions, as well as the optimization of physical and mental functioning. An active lifestyle and exercise routine along with eating well, is the best way to stay healthy. Eating a balanced diet can help provide the energy you need to finish a race, or just enjoy a casual sports or activity. You are more likely to be tired and perform poorly during sports when you do not get enough calories, carbohydrates, fluids, iron, vitamins and other minerals. Vitamins and minerals play an important role in energy production, maintain of bone, health, immune function and repair the muscle tissue during recovery from exercise and injury. So athletes should consume a diet that includes a variety of foods to optimize vitamin and mineral intakes rather than use nutritional supplements.

KEYWORDS :Vitamins, Minerals, Performance, Lifestyle, Nutrition, Health, Balance diet.

INTRODUCTION:

The nutritional requirement of the people varies depending on age, sex and physical activity. The physical activity of a sportsperson is many times more than the others. Naturally, their diet should be of balanced nutrient content irrespective of having false beliefs and misconception. The energetic

pills can throw the health of the sportsperson in garbage within a short period of time whereas energetic notorious diet can provide a health, wealthy and bright future to them. As well, they can be helpful in adding a brilliant story to the country's name and fame.

Interest in physical fitness is extremely high in the present day population. Whether the individual concern is respect to general health and the overall quality of life or with participation in athletics and possible competition, the routes to achievement of fitness differ only in degree. Both nutrition and exercise are closely involved with the important factor of body composition, muscular competence, respiratory and cardiovascular capabilities. Diet can influence performance and belief in the consumption of certain foods may confirm the psychological edge that is particular important to the athlete.

Now days sports performance have become very competitive, though good nutrition is essential for optimal physical performance. Today athletes and their coaches carry a similar misconception to the extreme. Most athletes feel they have consume enormous amount of protein to build muscle and perform well, but in fact concussion of a balanced diet to meet their calories needs in all that is necessary.

Micronutrients play an important role in energy production, hemoglobin and synthesis, maintenance of bone health, adequate immune function and protection of body against oxidative damage. Micronutrients assist with synthesis and repair of muscle tissue during recovery from exercise and injury. Pathway where micronutrients are required and exercise training may result in muscle biochemical adaptations that increase micronutrients needs. Routine exercise may also increase the turnover and loss of these micronutrients may be required to cover increased needs for building repair and maintenance of lean body mass in athletes.

The most common vitamins and minerals found to be of concern in athletes diet are calcium and vitamin D the B vitamin, iron, zinc, magnesium as well as some antioxidants such as vitamin C and E. -carotene and selenium use of vitamin and mineral supplements does not improve performance in individuals consuming nutritionally adequate diets.

MICRONUTRIENTS:

Vitamins and minerals are the two types of micronutrients. While only needed in small amounts, they play important roles in human development and well-being, including the regulation of metabolism, heartbreak and bone density. Vitamins are available in two forms: water-soluble and fat soluble. Minerals are also available in two forms: macro minerals and micro minerals.

VITAMINS:

Vitamins are organic compounds and a vital nutrient that an organism requires in limited amounts. Vitamins are substances that your body needs to grow and develop normally. Each vitamin has specific job. If athletes have low levels of certain vitamins, athlete may get health problems. So the best way to get enough vitamins is to eat balanced diet with a variety of foods.

MINERALS:

Mineral is a naturally occurring substance, representably by a chemical formula, that is usually solid and inorganic, and has a crystal structure. It is different from a rock, which can be an aggregate of minerals or non-minerals and does not have a specific chemical composition. Minerals are important for athlete to stay healthy. Athlete uses minerals for many different jobs, including building bones, making hormones and regulating heartbeat.

IMPORTANCE OF MICRONUTRIENTS FOR ATHLETIC PERFORMANCE:

Vitamins & minerals are not body builders but they are like lubricants and supporters essential for good health. A lack of a particular vitamin or mineral can lead of lower the sports performance. Vitamins and minerals are available in tablets. Capsules, powders and liquids but should not be taken without medical supervision. Too much intake of one particular vitamin or mineral can harm the body or upset the performance in sports.

Minerals help the sports body to perform various functions, such as building strong bones, transmitting nerve impulses, making hormones and maintaining a regular heartbeat. An athlete needs major minerals like calcium, potassium, iron, zinc, magnesium, copper and chromium . NO TASTE MEANS PROBABLY NO MINERALS.

Look at the difference in taste between a homegrown vegetables and the mass produced varicly. Even organically grown vegetables don't taste, because the soil they are grown in is mineral deficient.

POTASSIUM (K) is important for fluid and electrolyte balance, nerve transmission and active transport mechanism. The decreases of potassium in the body affects muscle activation that leads to muscle fatigue the cessation of exercise is possible due to decrease in plasma potassium I the recovering muscles and in non-contracting tissues.

IRON (Fe) – Iron is required for the formation of oxygen carrying proteins, hemoglobin & myoglobin and for enzymes involved in energy production. Oxygen carrying capacity is essential for endurance exercise as well as normal function of the nervous, behavioral and immune systems. Symptoms of iron deficiency include fatigue, Irritability, dizziness, headaches, lack of appetite, musculoskeletal problems and overuse injuries. Female athletes, who lose iron each month with their menstrual cycle, are also at higher risk of iron deficiency and iron-deficiency anemia. So, all the sports man and women are encouraged to take more iron for better performance in games and sports.

ZINC (Zn) – Zinc plays a role in growth building and repair of muscle tissue, energy production and immune status. Zinc status has been shown to directly affect thyroid hormone levels, BMR and protein use, which in turn can negatively affect health and physical performance. Zinc deficiency can affect muscle growth and less muscle function. It has been reported that change in extra cellular zinc levels influence tension relationship in the muscle.

MAGNESIUM (Mg) – Reduction of magnesium has also been in relation to exercise. This is to be a function of both sweat losses and distribution of magnesium to the working muscles. The magnesium deficiency rate shows a reduced endurance capacity and low anemia. Athletes in weight – class and body conscious sports, such as wrestling, ballet, gymnastics and tennis have been reported to consume inadequate dietary magnesium. Athletes should be educated about good food sources of magnesium.

CALCIUM (Ca) – Calcium is especially important for growth maintenance and repair of bone tissue, maintenance of blood. Calcium levels, regulation of muscle contraction, nerve conduction and normal blood clotting. Inadequate dietary calcium and vitamin D increase the risk of low bone mineral density and stress fractures. The discovery shows that sports persons with lack of calcium may develop osteoporosis.

CHROMIUM (Cr) the main metabolic function of chromium is the regulation of carbohydrate and decrease the body fat and increases in lean body mass in young man participating in weight training programs.

COPPER (Cu) – Copper is an essential that has a key role in iron metabolism, cross-linking of connective tissues, neuro transmitter and brain function, copper losses through sweat especially for people living in warm and humid climates.

VITAMINS are organic compounds that help to maintain normal body function, such as reproduction, growth and cell repair, Vitamins work with other vitamins and other substances like enzymes to help our cells functions correctly and an adequate consumption of vitamins is necessary for our body to work well. Our body can't manufacture vitamins, so you need to obtain them from adequate and variety of foods.

Most of the vitamins come from the food we eat, except vitamin D, which is our body makes when exposed to sunlight and K which is made by the bacteria in our intestines.

There are two Categories Vitamins:

WATER-SOLUBLE VITAMINS: Which include the B-complex group and vitamin C, travel through the bloodstream; whenever this body does not use water-soluble vitamins are eliminated in wine.

FAT-SOLUBLE VITAMINS: Vitamins A, D, E and K are stored in the fat tissues of the body for a few days to go to 6 months. If we get too much of fat soluble vitamins, it can be stored in our liver and may sometimes cause health problems.

THIAMIN (Vitamin-B) BARBOKA: Thiamin plays an important role in energy metabolism and in the nervous system. Thiamin activates muscles in the sports body. Some of the research records show that whose thiamin intake was adequate placed good in winning medals than whose diet was less in thiamin content. Thiamin deficiency has been associated with fatigue, loss of ambition, loss of performance efficiency, limitability, loss of vigor, anorexia and increased leg pain.

RIBOFLAVIN (Vitamin B-2): there is a close relationship between the level of protein intake and riboflavin. When the body takes low protein diet to comport the balance, Riboflavin catobolized the body protein stores and reduced riboflavin. This is seen particularly in subjects consuming low calorie (or) starvation diets. Heavy sports training may increase riboflavin requirements.

NICOTINIC ACID (Vitamin B3) : Nicotinic acid is a component of two important anxymes concerned with glycolysis fat synthesis. It helps in the intracellular respiratory mechanism of all cells.

VITAMIN B6 (PYRIDOXIE): vitamin B6 is required whenever high protein dicts are consumed. Which will act as a substitute whenever the breakdown of muscle glycogen. Deficiency of vitamin B led to decrease the performance and prone injuries. The sports persons who involved in vigorous and training require 2-3 times higher than the normal population.

PANTOTHENIC ACID: Pantothenic acid is a factor of vitamin B complex that acts as an intermediate metabolite carbohydrate and fat metabolism leading to energy release. It is contained in all animal and

plant tissues and its richest source is in royal jelly, which is not directly related to sports performance, but exercise may decrease pantothenate status.

VITAMIN B12 (CYANOCOBA LAMIN): This vitamin B12 is a required nutrient for the normal functioning of all cells. Vitamin B12 functions in protein metabolism and may also be involved in fat and carbohydrate metabolism. The deficiency of this vitamin raises lack of neuro-muscular coordination and muscle pain. Therefore the use of vitamin B12 injections before competitions is wide spread.

ASCORBIC ACID (Vitamin C) The studies indicate that strenuous exercise alters and decrease vitamin C metabolism. This may mean an increased need for the vitamin-C persons performing strenuous work. The vitamin-C may help in recovery from intense exercise and in injury repair.

VITAMIN A, D & K : Vitamin A, D & K fat-soluble vitamins that are present large quantities in the body is decreased by physical activity. Vitamin A is necessary for normal vision, bone growth and tissue integrity, Vitamin D help in the formation of teeth and bone. Vitamin K is necessary for normal blood clotting. These Vitamins are not directly related to sports performance but necessary to prevent and recovery of sports injury.

VITAMIN E: Vitamin E is also a fat-soluble vitamin may play an important role in the maintenance of the functional activity of the muscle tissues. The deficiency of vitamin E may lead to muscle damage and skin disease. Therefore sufficient vitamin-E is required for sports persons who involve in vigorous activities.

Table set by food and Nutrition Board USA in collaboration with sports clinic declared the recommended dietary allowances (R.D.A.) per day for sports men and women maximize sports performance.

Mineral/Vitamin	Needs per day	Food Sources
Calcium	2.0gm	Fish, ragi, cheese, Beans, Bajara, Milk products, Dark green leafy vegetable, whole grain products and legumes.
Iron	20gm	Driod beans, Peas, liver, whole grain, breads, cereals, dark green leafy vegetables, Eggs, Meat, Bone soup, Potatoes, sweet potatoes and prunes.
Vitamin 'A'	6000IU	Dark green and deep yellow vegetables, liver margarme canned tomatoes, prunes and chooss.
Vitamin 'C'	60mg	Canned or Frozen fruit juices, Tomatoes, Raw cabbage, Dark green leafy vegetables and potatoes.
Thiamin Vita. (B1)	1.9mg	Dried legumes, whole grain or enriched bread cereals, Liver pork, potatoes.
Riboflavin	1.8mg	Milk, Ice milk, cheese, whole grain, Breads, Eggs, legumes and dark green leafy vegetables.
Naicin	30gm	Dried beans, pess, Peanuts, Dalds, whole grain cereal products, meats, poultry, Fish and dark green leafy vegetables.

FROM OTHER RESOURCES

Iodine	150mcg	Fish, seafood, and iodized salt
Phosphorous	100mg	Milk, vegetable, Bajara, Ragi, Nuts etc.
Potassium	0.8-2.0g	Fresh vegetables, fruits, nuts, seeds, dairy food, banana, spinach, apricots, lean meats and whole grains
Zinc	40mg	Beef, cashews, garbanzo, beans and turkey.

CONCLUSION:

• Because of their interest in maximizing performance, athletes may seek to use dietary supplements to gain competitive advantages. However, the athletes should be aware of the following critical points.
• Performance will not be improved if individuals consuming nutritionally-adequate diets use nutritional supplements.
• Concerns about the nutritional adequacy of an individual diet should be evaluated by a registered dietician experienced in counseling athletes.
• Athletes should consume a diet that includes a variety of foods to optimize vitamin and mineral intakes rather than use nutritional supplements.
• Use of megadoses of vitamins and minerals is not recommended because of potential adverse interactions among nutrients and toxicity.
• Physically active people who intermittently use vitamin and mineral supplements as a prophylaxis should use a product that does not exceed the RDA or ESADDI for essential nutrients.
• Limit the quantity and rise the quanlity of diet.
• Maintain balance by taking variety of foods in your diet.

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