AWARENESS OF VITAMIN B12 DEFICIENCY AMONG THE GENERAL POPULATION

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DOI: http://dx.doi.org/10.24327/ijrsr.2017.0803.0086

INTRODUCTION

Vitamin B12 is a water-soluble vitamin that is naturally present in foods like milk, poultry, eggs, meat etc.\(^1\)\(^2\)\(^3\)

Methylcobalamin and 5-deoxyadenosylcobalamin are the forms of vitamin B12 that are active in human metabolism\(^2\). Vitamin B12 is required for proper red blood cell formation, normal functioning of the brain and the nervous system and in the formation of red blood cells. It also helps to regulate and synthesize DNA. It occurs in animal products, such as fish, meat, eggs, and dairy products. Vitamin B12 deficiency can result in irreversible and potentially severe damage, especially to the human nervous system and brain. It can also cause anemia.

Aim: To study the level of awareness on vitamin B12 deficiency among the general population and to educate the population on preventive measures.

Objective: To study the causes, signs and symptoms, treatment, investigation and prevention of vitamin B12 deficiency among the general population and to educate the population on preventive measures.

Background: Vitamin B12, or Cobalamin, is a water-soluble vitamin and plays a vital role in the normal functioning of the brain and the nervous system and in the formation of red blood cells. It also helps to regulate and synthesize DNA. It occurs in animal products, such as fish, meat, eggs, and dairy products. Vitamin B12 deficiency can result in irreversible and potentially severe damage, especially to the human nervous system and brain. It can also cause anemia.

Reason: This study is done inorder to understand the role of vitamin B12 and also help in the prevention and better treatment of diseases associated with its deficiency leading to better quality of life.

MATERIALS AND METHODS

This was a questionnaire based study. The questionnaire consisted of 15 well structured questions. Study subjects were recruited from a randomly selected population at Chennai (n =158). The subjects who participated were from different socio-economic backgrounds, age, educational background, locations and included men and women. The data collected was analyzed using Microsoft Excel (version 10) and tabulated along with explanatory visual charts with respect to the various parameters chosen.

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The results from the survey were analyzed. It was noted that the level of awareness among the general population was relatively high. Most of the subjects under the study acknowledge the role of vitamins in maintaining metabolism and in functioning of the body. They were aware of vitamin B12 deficiency. The normal plasma or serum level of vitamin B12 is 170-250 pg/mL. About 53% of the population knew that it was also known as Cobalmine, as it contained the mineral cobalt.

RESULTS AND DISCUSSION

The population was well informed about the effects it could have on the developing fetus in pregnant mothers with vitamin B12 deficiency. Vitamin B12 status is typically assessed via serum or plasma vitamin B12 levels. Values below approximately 170-250 pg/mL (120-180 picomol/L) for adults indicate a vitamin B12 deficiency. However, evidence suggests that serum vitamin B12 concentrations might not accurately reflect intracellular concentrations.

About half of the study population was well informed about the sources of vitamin B12. Vitamin B12 is naturally found in animal products, including fish, meat, poultry, eggs, milk, and milk products. Vitamin B12 is generally not present in plant foods, but fortified breakfast cereals are a readily available source of vitamin B12 with high bioavailability for vegetarians. Some nutritional yeast products also contain vitamin B12.

Only 38% knew that it lead to megaloblastic anemia, while most were convinced that it lead to pernicious anemia. Pernicious anemia is an autoimmune disease that affects the gastric mucosa and results in gastric atrophy. This leads to the destruction of parietal cells, achlorhydria, and failure to produce intrinsic factor, resulting in vitamin B12 malabsorption. Atrophic gastritis, a condition affecting 10%–30% of older adults, decreases secretion of hydrochloric acid in the stomach, resulting in decreased absorption of vitamin B12. Strict vegetarians and vegans are at greater risk than lacto-ovo vegetarians and non-vegetarians of developing vitamin B12 deficiency because natural food sources of vitamin B12 are limited to animal foods. Vitamin B12 crosses the placenta during pregnancy and is present in breast milk. Exclusively breastfed infants of women who consume no animal products may have very limited reserves of vitamin B12 and can develop vitamin B12 deficiency within months of birth.

Most of the population believes increased consumption of alcohol, age factor, a vegetarian diet and autoimmune disease lead to the increased prevalence of vitamin B12 deficiency.
Some patients might prefer Vitamin B12 in a gel formulation applied intranasally\(^\text{20}\). The various treatment methods were popular among the public, however only 3% knew about the nasal therapy for the same.

Vitamin B12 deficiency is characterized by megaloblastic anemia, fatigue, weakness, constipation, loss of appetite, and weight loss\(^\text{23}\). Neurological changes, such as numbness and tingling in the hands and feet, can also occur\(^\text{4,21}\). Additional symptoms of vitamin B12 deficiency include difficulty maintaining balance, depression, confusion, dementia, poor memory, and soreness of the mouth or tongue\(^\text{22}\). The neurological symptoms of vitamin B12 deficiency can occur without anemia, so early diagnosis and intervention is important to avoid irreversible damage. This study established that only 19% were fully aware of all the symptoms and the rest had a general idea of the same.

From this we can conclude that the participants were aware of Vitamin B12 deficiency and had good knowledge of the same. This study established that etiology, cause, symptoms, diagnoses and treatment of the same was familiar among the study group. This could be due the literacy percentage and socio-economic status of the population. Increased awareness and knowledge of the same can be brought about by organizing camps, health programs and conference on the same by both government and non-governmental organizations. This study is done inorder to understand the role of vitamin B12 and also help in the prevention and better treatment of diseases associated with its deficiency leading to better quality of life\(^\text{23}\).

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How to cite this article:
Jerusha Santa Packyanathan 2017, Awareness of Vitamin B12 Deficiency among the General Population. Int J Recent Sci Res, 8(3), pp. 16149-16152. DOI: http://dx.doi.org/10.24327/ijrscr.2017.0803.0086

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