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Vitamin D Supplements can Repair Heart Failure Patients

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Review Article

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ABSTRACT

Vitamins are the nutrients that are required through diet/supplements as they cannot be synthesized by the body. It is considered as a pro-hormone because the body is capable of producing its own vitamin D through the exposure of sunshine on the skin. Blood-pumping of the heart failure patients can be improved by daily dose of Vitamin D which can lead to shortness of breath and exhaustion. Vitamin D levels can be increased by exposing the skin to sunlight. It is often lacking in heart failure patients because they tend to be older and less likely to engage in outdoor activities.

INTRODUCTION

Vitamin D is a fat-soluble vitamin that is naturally present in the foods plays a specific role in bone metabolism as well as protecting against colds and depression [1]. Most vitamin D can be obtained by exposing the skin to sunshine and their supplements could heal heart failure patients. It helps in the growth of bones and without sufficient vitamin D, bones can become thin and brittle. It is also used for treating weak bones (osteoporosis), bone pain (osteomalacia), bone loss in people with a condition called hyperparathyroidism, and an inherited disease (osteogenesis imperfecta) in which the bones are especially brittle and easily broken. Vitamin D has a significant role in calcium homeostasis and metabolism. Heart failure is also called congestive heart failure (CHF). CHF occurs when the heart can no longer pump enough blood to the rest of the body [2-5]. Vitamin D supplements may be necessary for older people especially people living in northern latitudes, and for dark-skinned people who need extra time in the sun, but don't get it.

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BACKGROUND AND PHYSIOLOGY

Vitamin D is a hormone antecedent that is available in 2 forms. Ergocalciferol, or vitamin D_2, is available in plants and some fish [6-10]. Cholecalciferol, or vitamin D_3, is blended in the skin by daylight. People can satisfy their vitamin D prerequisites by either ingesting vitamin D or being exposed to the sun for enough time to deliver sufficient amounts **(Figure 1).** Vitamin D controls calcium assimilation in the small intestine and works with parathyroid hormone to mediate skeletal mineralization and keep up calcium homeostasis in the circulatory system [11].

Figure 1. Vitamin capsules for the growth.

SYNTHESIS OF VITAMIN D

Vitamin D is manufactured in the skin after the absorption of sunlight. It is ingested through food and supplements, absorbed by the intestines and carried to the liver via bloodstream [12-15]. Once in the liver, vitamin D turns into 25(OH)D (Calcidiol), the primary form of circulating vitamin D.

SOURCES

Vitamin D is produced when the skin is exposed to sunshine. It also comes from oily fish, eggs and is added to many so-called *fortified foods* such as breakfast cereals and milk [16-18]. Many people are deficient in Vitamin D (vitamin D deficiency), often because they do not get enough exposure to sunlight during the day **(Figure 2).** The skin's ability to manufacture vitamin D also gets less effective with age. Vitamin D supplements may help people with diseased hearts [19-22].

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Figure 2. Different sources of vitamins & minerals for the heart failure patients.

SIGNIFICANCE OF VITAMIN D

Vitamin D prevents heart failure and the synthesis of vitamin D facilitates calcium absorption from the small intestine, calcium reabsorption from the kidneys and the rebuilding of bone tissue. It is important for healthy bones and teeth and is also believed to improve the hearts' ability to pump blood around the body [23-26].

How Vitamin D Works?

Vitamin D acts as a hormone, regulating more than 200 genes throughout the body and keeps abnormal cells from multiplying in breast and colon tissues [27]. It also helps in regulating blood pressure in the kidney and blood sugar levels in the pancreas [28-32].

Health Benefits of Vitamin D

Vitamin D helps in regulating the absorption of calcium and phosphorous [33-36]. These nutrients are needed to keep bones, teeth and muscles healthy. A lack of vitamin D can lead to bone deformities such as rickets in children, and bone pain and tenderness as a result of a condition called osteomalacia in adults [37-42]. It is also important for normal growth and development of bones and teeth, as well as improved resistance against certain diseases [43-45]. Because vitamin D is involved in regulating the levels of minerals such as phosphorous and calcium, it is used for conditions caused by low levels of phosphorous (familial hypophosphatemia and Fanconi syndrome) and low levels of calcium [46-49].

Low Levels of Vitamin D Leads to Higher Risk for Cardiovascular Disease

Vitamin D may lower the risk of congestive heart failure because it reduces the risk of diseases that may lead to high blood pleasure, diabetes and coronary heart disease [50-54]. It also strengthens the heart muscle and reduces inflammation.

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What Causes Vitamin D Deficiency? Who does it affect most?

When the skin is exposed to sun, body itself produces vitamin D [55]. As people are spending less time outside and also using sunscreen there is a general deficiency [56-58].

Factors to Lower Vitamin D Levels

- Women have lower vitamin D levels as they spend most of the time indoor and also applying sunscreens while coming outdoors and tend to wear hats and sunscreen more often than men [59,60].
- Age also plays a role in vitamin D deficiency, because as people get older they absorb less vitamin D from their diet and produce less vitamin D in their skin. Also, their reduced activity gives them less opportunity to be outdoors.
- Obesity is an important factor because fat cells absorb vitamin D and keep it from circulating throughout the bloodstream.

CONCLUSION

Taking vitamin D supplements may improve cardiac function in chronic heart failure patients. Vitamin D_3 can be boosted by exposure to sunlight, but heart failure patients are often deficient in it even during the summer because older people make less vitamin D_3 in response to sunlight than younger people.

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