How can this be prevented?

By using knowledge and connecting with interconnecting organ systems, the ways to prevent are purely based on trying to rebuild the deficiency of Vitamin D, calcium, and phosphate.

By using the skin’s ability to absorb vitamin D, people living in undeveloped countries and habitats with limited sunlight; people who stay indoors, work indoors all day, and dark skinned children must try to get more sun exposure to have enough vitamin D to have healthier bones.

In addition, the digestive system digests and absorbs nutrients, so taking vitamin D supplements can also help, especially if the person is on a vegan diet, vegetarian diet, lack milk product intake, or is lactose intolerant.

Finally, since the bones rely on having vitamin D and calcium, it can be preventable by intaking any supplements, food, or drinks that have these nutrients in them such as: fish oils, fatty fishes, egg yolks, milk, cereal, and juices.

However, missing these nutrients due to: celiac diseases (a condition that damages the lining of the small intestine and prevents it from absorbing parts of food); inflammatory bowel diseases (inflammation in digestive tract); cystic fibrosis (mucus build up in lungs, liver, and other body parts; liver disorders, kidney problems, and other genetic diseases should be looked at by professionals.

Awareness

This pamphlet was created solely for the purpose of raising awareness about rickets. This was created for reason of spreading awareness to others in the community, so they can develop an understanding of what rickets is and how it is still important to spread awareness towards better health. Although rickets is a disease that may not as present in the US as there are in other countries, it is still vital to ensure nutrients like calcium, vitamin D, and phosphate are incorporated into diets.

Contact

This pamphlet was made to spread awareness about rickets, and it is also part of the MYP Personal Project that I am working on for the IB program at Smoky Hill High School. MY goals was to answer the question of “How does understanding different body systems affect how one comprehends ways to understand and prevent a disease?” I have also created a website to reach out to the global community as well. If you want to learn more about rickets and my project, please visit:

https://ricketsproject.wordpress.com/

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By Katherine Nguyen
What is Rickets?

Rickets is generally a disease that commonly occurs where the bone softens and weakens due to the lack of vitamin D, calcium, and phosphate. This disease is mainly developed in children, especially between the ages of 6 and 24 months. In addition, rickets can develop in the kidneys through kidney diseases, genetically or directly. Sometimes, due to the lack of direct sunlight or having a vegan diet, there can be the absence of nutritional supplements, especially vitamin D, calcium, and phosphate.

There are some well-known subtypes of rickets, including hypophosphatemic rickets, kidney rickets, and nutritional rickets or osteomalacia. These subtypes of rickets are the three main causes for rickets. The three types of rickets are:

- **Nutritional Rickets (A.K.A. Osteomalacia)** - caused by vitamin D deficiency, and usually dark-skinned infants, children lacking sunlight exposure, and children breastfeeding from mothers deficient of vitamin D are at risk for this type of rickets.

- **Hypophosphatemic Rickets** - caused by low levels of phosphate due to genetically having insufficient ability to control the amount of phosphate exerted in urine and found in mainly patients of 1 year of age. However, this kind is not caused by vitamin D deficiency.

- **Renal (Kidney) Rickets** - caused by kidney disorders and usually decreases the ability to regulate the amount of electrolytes lost, since kidneys are vital in regulating the electrolytes. This type has similar symptoms of nutritional rickets.

What Body Systems are Related to or Affected by Rickets?

The body systems affected or related to rickets are mainly the integumentary, skeletal, and digestive systems.

Skin is a part of the integumentary system and is one of the most important ways of getting vitamin D. However, if a person lacks contact with the sun, the skin cannot absorb the vitamin D needed in order for other body systems that need to function properly. Also, the pigments of darker skin color also can affect the amount of vitamin D intake is taken from sun contact.

The skeletal system is one of the systems greatly affected due to lack of Vitamin D, calcium, and phosphate. Due to these factors, symptoms such as bowlegs, spinal deformities, misshaped pelvis, deformed skull, and misshaped teeth occur.

The last major organ system is the digestive system. The digestive system is a vital part of a person’s body because it absorbs nutrients, unless other diseases affecting bowel movements and absorbing nutrients can cause this disease to effect bones.