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Research Article

Understanding Hypovitaminosis-D Dominance & Risk Factors

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Abstract

Hypovitaminosis is a term used to describe the human condition characterized by deficiency of vitamins. It is a state or condition often overlooked in public health concerns. Vitamins are essential and micronutrients play a vital role in maintaining good health, vitality and pleasant life. Vitamin-D deficiency, in long run, may lead us to have osteoporosis, autoimmune and even cardiovascular diseases. The paper attempts to study the present scenario of vitamin-d deficiency all over India and to compare the condition with worldwide countries. It also shows the past and present scenario supported with the study of international osteoporosis foundation, Indraprastha Appollo hospital and report of National Institute of Arthritis and Musculoskeletal and skin diseases. The data pertaining to the topic reveals the status and risk factors along with remedial steps.

Key words: Hypovitaminosis, osteoporosis, risk-test, rickets

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Introduction

New age diseases and hypovitaminosis are predominantly increasing day by day in the modern society. Hypovitaminosis is a term used to describe the deficiency of Vitamins. It can result from inadequate intake coupled with inadequate sunlight exposure, disorders that limit its absorption, conditions that impair conversion of vitamin D into active metabolites, such as liver or kidney disorders, or, rarely, by a number of hereditary disorders. Deficiency results in impaired bone mineralization, and leads to bone softening diseases, rickets in children and osteomalacia in adults, and contributes to osteoporosis.

Vitamin D is better known as the "sunshine vitamin" because humans are able to synthesize much of their required intake through proper exposure to the sun. Vitamin D helps produce hormones responsible for

regulating the body's calcium levels, so proper amounts of Vitamin D are essential for bone growth and maintenance, though deficiencies in this nutrient can cause many additional health problems. This widespread prevalence of vitamin D deficiency/insufficiency has a deleterious effect on bone mineral homeostasis and peak bone mass achieved, and may subsequently reflect as low bone mineral density

As we age, calcium and phosphate may be reabsorbed back into the body from the bones, which makes the bone tissue weaker. This can result in brittle, fragile bones that are more prone to fractures, even without injury. Usually, the loss occurs gradually over years. Many times, a person will have a fracture before becoming aware that the disease is present. By the time a fracture occurs, the disease is in its advanced stages and damage is severe. The leading causes of

osteoporosis are a drop in estrogen in women at the time of menopause and a drop in testosterone in men. Women over age 50 and men over age 70 have a higher risk for osteoporosis.

Present Status: Recently studies carried across different countries in south and south-east Asia showed, with few exceptions, widespread prevalence of hypovitaminosis D, in both sexes and all age groups of the population. It causes hyperparathyroidism, disorder in renal function, left ventricular hypertrophy, **osteoporosis** etc. It's malnutrition may also be linked to an increased susceptibility to several chronic diseases such as autism, high blood pressure, multiple sclerosis, type I diabetes etc. The criteria used for defining hypovitaminosis D in most of the studies was a serum 25(OH)D level below 50nmol/L.

In north India 96% of neonates, 91% of healthy school girls, 84% of pregnant women were found to have hypovitaminosis D. It is prevalent highly among pregnant women and children. In Bangladeshi women the percent is 44. In Srilanka it is 41%. In post menopausal women it is 47% in Thailand, 49% in Malaysia, 90% in Japan and 92% in South Korea.

Rickets appears to be common in Mongolia and China (40°N) [25], and this is probably related both to poor vitamin D status and low calcium intake. In a study from north China (Beijing), 89% of Chinese adolescent girls had hypovitaminosis D (serum 25(OH)D <50nmol/L) [26] and 48% of old men had severe hypovitaminosis

Causes: There are actually many ways can be identified that may cause vitamin D deficiency; Age, heredity, inadequate sun exposure, liver and kidney disorder, melanin etc.

Osteoporosis:-

Osteoporosis is a significant health problem that affects more than 25 million women in the United States and potentially 200 million worldwide. This disease is characterized by diminishing the structure of the skeleton (particular the "spongy" bone). This results in an increased risk of fracture. Osteoporosis develops silently over a period of years, eventually progressing to a point where a fracture can easily occur causing pain and disability. This disease is characterized by low bone mass and structural worsening of your bones, leading to bone fragility. There is an increased chances of damaging the hip, spine, and wrist. It is a skeletal disorder that reduces bone strength leading to an increased risk of fracture. It occurs when the bone mass become thin due to depletion of calcium and bone protein. Women lose their bone density from their mid 30's; at a rate of 1% per year and after their menopause the rate doubles and even triples.

According to the National Osteoporosis Foundation, a woman's risk of hip fracture is equal to her combined risk of breast, uterine, and ovarian cancer. In 1991, approximately 300,000 Americans were admitted to hospitals with hip fractures, and an average of 24% of hip fracture patients aged 50 and over died in the year following their fracture. Frail bones caused by

osteoporosis were considered the underlying cause for most of these hip fractures.

Osteoporosis is a disease that gradually weakens bones, so they become more and more fragile and likely to break (Osteoporosis 2). The disease causes brittleness in the spine, wrists, and hips. Bones become weak because of bone loss. Bone loss is when you are losing some of the material that makes up your bones, which causes a loss of bone density and thickness. Bone density is what makes your bones strong and less likely to break. If not prevented or left untreated, osteoporosis can lead to bone breaks.

Although women are more likely to develop osteoporosis, men who have taken steroids, have abused alcohol, or have reduced testosterone levels may be at risk. According to the National Institutes of Health, 1 in 8 men and half of all women over the age of 50 will experience an osteoporosis related fracture. Approximately 28 million people are currently coping with osteoporosis. All men and women lose bone mass as they age, but not everyone has osteoporosis. Osteoporosis is a disease characterized by an excessive decrease in bone mass that leads to an increased susceptibility to fracture. Although most individuals lose bone mass as they age, the remaining bone is usually strong enough to support the stress of daily activities and is healthy and capable of repair after fracture. Osteoporosis, however, weakens the bones to a point that a bump or a fall can cause a painful fracture of the hip, spine, or other bones.

Symptoms

Osteoporosis is often called the "silent disease" because bone loss occurs without symptoms. In many cases, the first "symptom" is a broken bone. Patients with osteoporosis may not know that they have the disease until their bones become so weak that a sudden strain, bump, or fall causes a hip fracture or a vertebra to collapse. Collapsed vertebra may initially be felt or seen in the form of severe back pain, loss of height, or spinal deformities such as kyphosis, or severely stooped posture

Symptoms occurring late in the disease include:

- Bone pain or tenderness
- Fractures with little or no trauma
- Loss of height (as much as 6 inches) over time
- Low back pain due to fractures of the spinal bones
- Neck pain due to fractures of the spinal bones
- Stooped posture or kyphosis, also called a "dowager's hump"

Currently, there is an increasing incidence of hip fractures in the developed cities in Asia. 1 out of 4 hip fractures occur in Asia and Latin America. This number of hip fractures will increase to 1 in 2 by 2050. In the Middle East, the burden of osteoporosis in the general population is expected to increase and is becoming a heavy financial burden. The annual incidence rate of osteoporotic fractures in women is greater than the combined incidence rates of heart attack, stroke and breast cancer

According to World Health Organization (WHO), osteoporosis is second only to cardiovascular disease as a global healthcare problem and medical studies show a 50-year-old woman has a similar lifetime risk of dying from hip fracture as from breast cancer.

1 out of 8 males and 1 out of 3 females in India suffers from osteoporosis, making India one of the largest affected countries in the world. Expert groups peg the number of osteoporosis patients at approximately 26 million (2003 figures) with the numbers projected to increase to 36 million by 2013. Two points worth noting about osteoporosis in India - the high incidence among men and the lower age of peak incidence compared to

Western countries. The incidence of hip fracture is 1 woman to 1 man in India 25 .In most Western countries, while the peak incidence of osteoporosis occurs at about 70-80 years of age, in India it may afflict those 10-20 years younger, at age 50-60.

Diagnosis

Medical Test:- Bone Mineral Density Test (BMD)

* Test measures bone density in the spine, wrist & hip

* Can detect low density before a fracture occurs

* Can predict your chances of fracturing in the future.

Manual Test:- One Minute Risk Test (OMR)

(Developed by IOF)

ONE MINUTE RISK TEST

No.	Questions	Options	
No.	Questions	Yes	No
1	Have either of your parents been diagnosed with osteoporosis or broken a bone after a minor fall (a fall from standing height or less)?		
2	Did either of your parents have a “dowager’s hump”?		
3	Are you 40 years old or older?		
4	Have you ever broken a bone after a minor fall, as an adult?		
5	Do you fall frequently (more than once in the last year) or do you have a fear of falling because you are frail?		
6	After the age of 40, have you lost more than 3 cm in height (just over 1 inch)?		
7	Are you underweight (is your Body Mass Index less than 19 kg/m ²)		
8	Have you ever taken corticosteroid tablets (cortisone, prednisone, etc.) for more than 3 consecutive months (corticosteroids are often prescribed for conditions like asthma, rheumatoid arthritis, and some inflammatory diseases)		
9	Have you ever been diagnosed with rheumatoid arthritis?		
10	Have you been diagnosed with an over-reactive thyroid or over-reactive parathyroid glands?		
For women only			
11	Did your menopause occur before the age of 45?		
12	Have your periods ever stopped for 12 consecutive months or more (other than because of pregnancy, menopause or hysterectomy)?		
13	Were your ovaries removed before age 50, without you taking Hormone Replacement Therapy?		
For Men			
14	Have you ever suffered from impotence, lack of libido or other symptoms related to low testosterone levels?		
15	Do you regularly drink alcohol in excess of safe drinking limits (more than 2 units a day)?		
16	Do you currently, or have you ever, smoked cigarettes?		
17	Is your daily level of physical activity less than 30 minutes per day (housework, gardening, walking, running etc.)?		
18	Do you avoid, or are you allergic to milk or dairy products, without taking any calcium supplements?		
19	Do you spend less than 10 minutes per day outdoors (with part of your body exposed to sunlight), without taking vitamin D supplements?		

If one answer ‘Yes’ to any of the questions, he/she may be at risk of developing Osteoporosis.

Prevention

The following preventive measures can be followed for controlling osteoporosis.

* Maintaining a healthy life style keeping a balanced diet with adequate calcium and Vitamin D.

* Avoid smoking and high intake of alcohol.

* Take regular & weight bearing exercise include running, skipping, aerobics, brisk walking etc.

Treatment:-Calcium and Vitamin D supplements can be used for older people to reduce the risk of Osteoporosis.

1. RDA (Recommended Daily Allowance) in Calcium is 1200 mg/day and (10-20 microg) for Vitamin D.(Amount is safe and free of side effects.)

2. HRT:- *Hormone Replacement Therapy*
Estrogen replacement for women at the menopause shall be advisable.

3. Drugs:- *SERMs (Selective Estrogen Receptor Modulators)*

Conclusion:

The bone disease osteoporosis can be controlled and avoided by giving attention to oneself. Develop the attitude by taking up some physical activity exposing to sunlight and maintaining good and balanced diet filled with adequate Vitamins and Minerals.

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