

Pattern of Vitamin D Status in Health and Disease

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Abstract

Background: A ten year old male child presented with altered behaviour, low intelligence quotient and skin lesions. The child also had respiratory discomfort and palpitations. On investigation, a cardiac rhabdomyoma was located and excised. The skin lesions were ash leaf macules[1], shagreen patches and papulonodular lesions on the face and periungual region on the foot. This combination makes the diagnosis evident as tuberous sclerosis. **Methods:** Biopsy of the papulonodular lesions were done and histopathology revealed them as angiofibroma (adenoma sebaceum).[2] An angiofibroma by definition is supposed to have proliferation of blood vessels and fibrous tissue on microscopic examination. **Results:** This angiofibroma had in addition hyperplasia of sebaceous glands. A review of the literature revealed that sebaceous hyperplasia is only a secondary change in an angiofibroma. **Discussion:** This case is presented here to highlight the microscopic diagnosis of angiofibroma and to state that sebaceous gland proliferation though a secondary change, can also present in angiofibromas and pathologists need not look for another diagnosis.

Keywords: Angiofibroma; adenoma sebaceum; sebaceous hyperplasia.

Introduction

Vitamin D is formed when 7 – dehydrocholesterol in the skin is exposed to solar UVB and then converted to previtamin-D, in a heat dependent process, previtamin D, is immediately converted to Vitamin D. Vitamin D plays an important role in maintaining an adequate level of serum calcium and phosphorus.

How it works

Vitamin D is one of the four fat soluble vitamins and the best known role is to keep bones healthy by increasing the intestinal absorption of calcium. 30% to 40 % absorption of calcium occurs when vitamin

reserve is normal. Many of the body tissues contain Vitamin D receptor, a protein that binds to Vitamin D. Organs like prostate, heart, blood vessels, endocrine gland contain Vitamin D receptors.

Natural sources of Vitamin D

Ultraviolet B from sunshine

Dietary sources- Salmon, Mackerel, Tuna, Cod liver oil, Shultake mushroom, egg yolk

Materials and methods

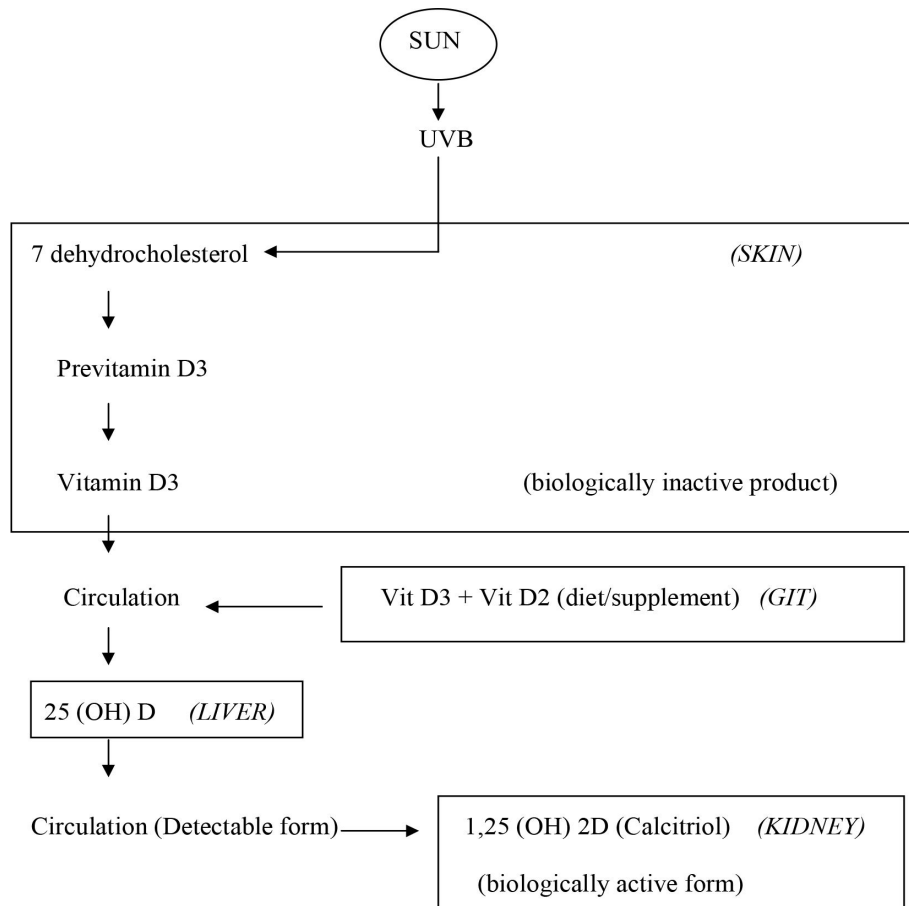
A study has been done with the patients of different age groups and of different diseases referred to our laboratory.

The period of study was 16 months (February 2012 to June 2013)

Total number of patients = 510

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Sources: sites and processing of Vitamin D metabolites

Methods and materials used

Enzyme linked Immunosorbent Assay (ELISA) test done for in vitro determination of 25 (OH) Vitamin D in the serum or plasma samples.

ELISA kit used: EUROIMMUN from Germany (marketed in India by CPC Diagnostics Pvt. Ltd)

Biological reference range for Vitamin D

Deficiency: < 20 ng/ ml

Insufficiency: 20 -30 ng/ ml

Sufficient: 30 -150 ng/ml

Toxicity: >150 ng/ml

(Michael F, Hollick, Vitamin D deficiency. N. Engl.J. Med 2007; 357: 266-281)

Profile of the study group (n=510)

- Osteoporosis
- Osteomalacia
- Rickets

- Parathyroid disease
- Body aches
- Chronic fatigue
- Steroid users
- Skin disorders
- Cancer
- Heart disease
- Diabetes
- Hypertension
- Kidney disease
- Dental problem
- Depression
- Elderly age

Result

Total number of cases: 510

Male: 157

Female: 353

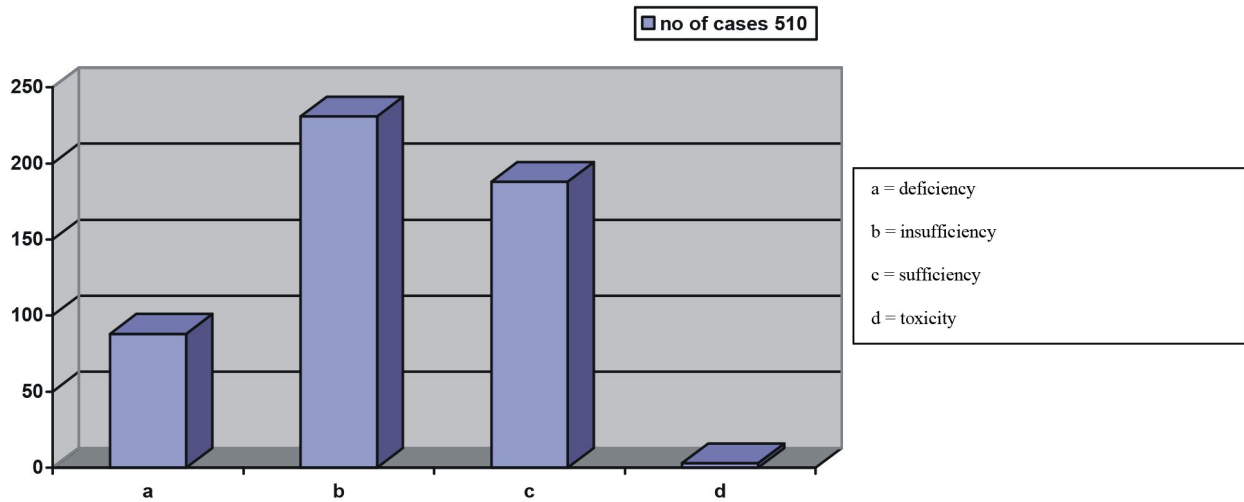
Total no. of deficiency cases: 88 (17.25 %)

Total number of sufficiency cases: 188 (36.8 %)

Total of insufficiency cases: 231 (45.29%)

Total no of Toxicity cases: 3 (0.5 %)

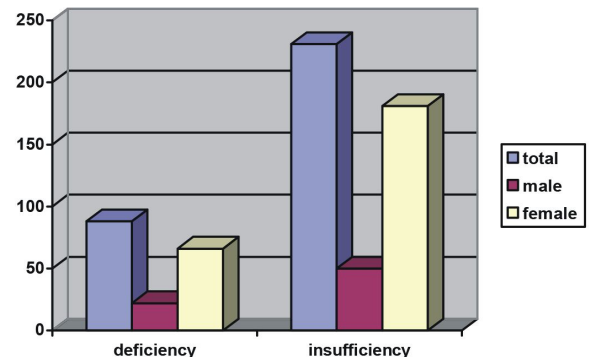
Result: (all cases)



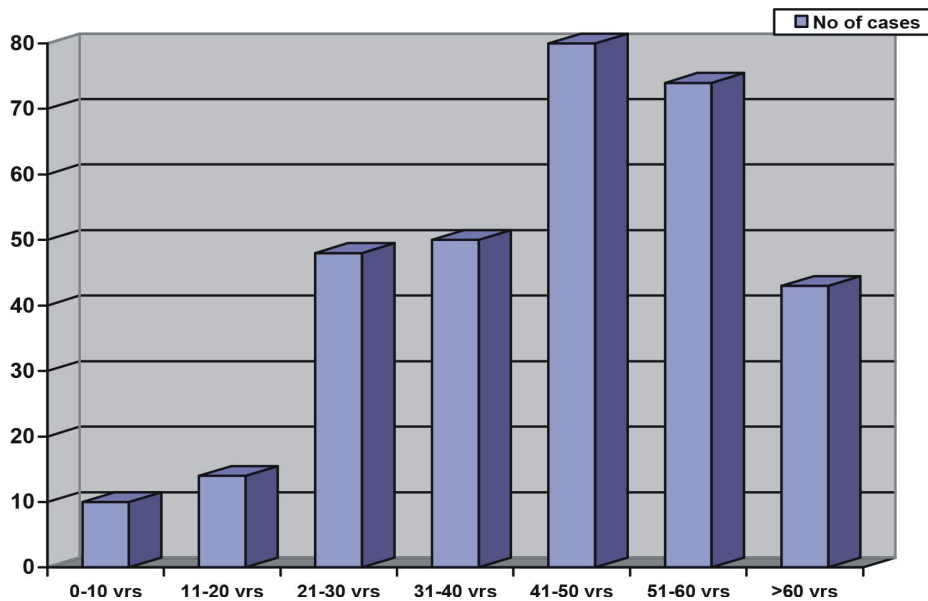
Result

- Total male deficient cases: 22 (4.3 %)
- Total female deficient cases: 66 (12.9 %)
- Total male insufficiency cases: 50 (9.8%)
- Total female insufficiency cases: 181 (35.4 %)

Result: (deficiency & insufficiency) male and female



Result: (Total deficiency and insufficiency cases, N=319) age wise break up



| Age group | 0-10 yrs | 11-20 yrs | 21-30 yrs | 31-40 yrs | 41-50 yrs | 51-60 yrs | >60 yrs |
|--------------------|----------|-----------|-----------|-----------|-----------|-----------|---------|
| Number of patients | 10 | 14 | 48 | 50 | 80 | 74 | 43 |

Causes of deficiency/ insufficiency

| | | |
|--------------------------|---|---|
| • Lack of Sun exposure | - | firm/ factory/ office work/ sunscreen lotion/ use of burkha/ dark skin people |
| • Dietary pattern | - | Vegetarian diet |
| • Elderly people | - | decreased 7 dehydrocholesterol |
| | - | decreased renal production of 1, 25 dihydroxy Vit D |
| | - | decreased intake of fortified food |
| • Altered fat metabolism | - | Crohn's disease, Cystic fibrosis, coeliac disease, Gastric intestinal resection |
| • Use of anticonvulsants | | |
| • Chronic Renal disease | | |

Conclusion

- ▶ Large number of our people (patients) are found to be having either deficient or insufficient levels of Vitamin D
- ▶ Women in the 41 -60 years of age group are worst affected.
- ▶ Both the deficient and insufficient cases will require Vitamin D supplementation.
- ▶ The dose of Vitamin D supplement will vary depending on their blood levels.

- ▶ Although very rare, Vitamin D toxicity requiring therapeutic intervention was also found in our patients.

References

1. http://nof.org/files/nof/public/content/clinicalupdates/clinicalupdates/Issue25VitaminD/2012_VitaminD.html.
2. http://www.japi.org/january_2009/R-1.html.
3. <http://cjasn.asnjournals.org/content/3/5/1535.full>.