Therapeutic Potential of Homeopathy in addressing Vitamin D deficiency: A clinical overview with a case report

Dr. Srinivas Babu Kathi [1*], Dr. Bhavya Shikha[2], Dr. Kavya Boini [3], Dr. Shilpa Bais [4], Dr. Masira Fathima Zeba[5], Dr. Aleena Zainab[6], Dr Afeefa Sadaf [7]

*[*1] Corresponding Author, PhD- Scholar Tantia University. Medical Superintendent, Head of The Department of Homoeopathic Pharmacy, Hamsa Homeopathy Medical College, Hospital & Research Centre, Siddipet (Dist.), Telangana State 502279.*

[2]Associate professor Pg Dept. of Paediatrics, Jims Homoeopathic Medical College Venkanna Guda Telangana State

[3]Assistant Professor of the Department of Homoeopathic Pharmacy, Hamsa Homeopathy Medical College, Hospital & Research Centre, Siddipet (Dist.), Telangana State 502279.

[4]Associate professor, HMM Department Amaltas institute of homeopathy science and research centre.

[5] Internee; 2019-2020 Batch, Hamsa Homeopathy Medical College, Hospital & Research Centre, Siddipet (Dist.), Telangana State 502279.

[6]Internee; 2019-2020 Batch, Hamsa Homeopathy Medical College, Hospital & Research Centre, Siddipet (Dist.), Telangana State 502279.

[7]Internee; 2019-2020 Batch, Hamsa Homeopathy Medical College, Hospital & Research Centre, Siddipet (Dist.), Telangana State 502279

Abstract- Background: Vitamin D deficiency is a biochemical diagnosis, which is defined to be present when serum 25(OH)D concentrations are below 25nmol/L (10ng/mL). People with vitamin D levels in the range, 25-50 nmol/L (10-20ng/mL) said to have vitamin D insufficiency, whereas those with 25(OH)D levels above 50 nmol/L are classified as having normal vitamin D status. The likelihood of developing vitamin D deficiency is strongly related to sunlight exposure. It is commonly in northern latitudes and show seasonal variation. Vitamin D deficiency is more common in the winter and spring and less common in summer and autumn. People with dark skin and those who wear facial coverings are more prone to developing vitamin D deficiency [2]

The prevalence of vitamin D deficiency range from 40% to 99%, with most of the studies reporting a prevalence of 80% to 90%. It was prevalent in all the age groups and high-risk groups alike.[1]

Introduction: The nutritionally important forms of vitamin D in man are Calciferol (vitamin D_2) and cholecalciferol (vitamin D_3). Cholecalciferol is naturally occurring vitamin D which is found in animal fats and fish liver oil. It is also derived from exposure to UV rays of the sunlight which convert the cholesterol in the skin to vitamin D. Vitamin D is largely stored in the fat depots.[3]

Materials And Methods: Literature search was done from standard medical books, standard Homoeopathy books, search databases like Google Scholar, reference articles, and homoeopathy websites.

Result: Summary of the case: A female patient of age 15 years with h/o vitamin D deficiency came to the clinic with complaints of irregular and profuse menses, headache, hair fall, obesity, and neck pain. On homoeopathic treatment, after considering the case analysis and repertorial analysis, the chosen similimum is proven to be effective in treating vitamin D deficiency.

Conclusion: Vitamin D deficiency is associated with weight gain and bone pain. This case illustrates that individualized homeopathic management, including the administration of Calcarea carbonica 200 and Thyroidinum 30C as intercurrents, contributed to improving levels of vitamin D in the body.

Keywords: Vitamin D deficiency, Sunlight Vitamin, Hypovitaminosis D, Homoeopathy, Constitutional treatment.

INTRODUCTION

Vitamin D status has been assessed by measuring serum levels of 25-dihydroxyvitamin D (25(OH)vitamin D); however, there is no consensus on a uniform assay or on optimal serum levels. The

optimal level might, in fact, differ according to the targeted disease entity. Risk factors for Vitamin D deficiency are old age, lack of sun exposure, dark skin (especially among residents of northern latitudes), fat malabsorption and obesity. Rickets represents the classic disease of vitamin D deficiency. Sign of deficiency are muscle soreness, weakness and bone pain. Some of these effects are independent of calcium intake.[4]

The upper limit of intake has been set at 4000 IU/d. Contrary to earlier beliefs, Acute vitamin D intoxication is rare and usually is caused by the uncontrolled and excessive ingestion of supplements or by faulty food fortification practices. High plasma levels of 1,25$(OH)_2$ vitamin D and calcium are central features of toxicity, mandating the discontinuation of vitamin D and calcium supplements; in addition, treatment of hypercalcemia may be required.[4]

OBJECTIVES

The objective of the case report is to evaluate the effectiveness of homeopathic medicine in managing vitamin D deficiency.

REVIEW OF LITERATURE[5]

Vitamins may be regarded as organic compounds required in the diet in small amounts to perform specific biological functions for normal maintenance of optimum growth and health of the organism.

Classification of vitamins:

Vitamins are classified as *Fat soluble* and *water soluble.*

The fat-soluble vitamins are vitamin A, D, E, K. The water-soluble vitamins are vitamin C & B.

Vitamin D

Vitamin D is a fat-soluble vitamin. It resembles sterols in structure and functions like a hormone.

Absorption, Transport, and Storage:

Vitamin D is absorbed in the small intestine, for which bile is essential. Through the lymph, vitamin D enters the circulation bound to plasma alpha 2-globulin and is distributed throughout the body. Liver and other tissues store small amounts of vitamin D.

Metabolism and biochemical functions:

Vitamin D2 and D3, as such, are not biologically active. They are metabolized identically in the body and converted to active forms. The metabolism and biochemical function of vitamin D is

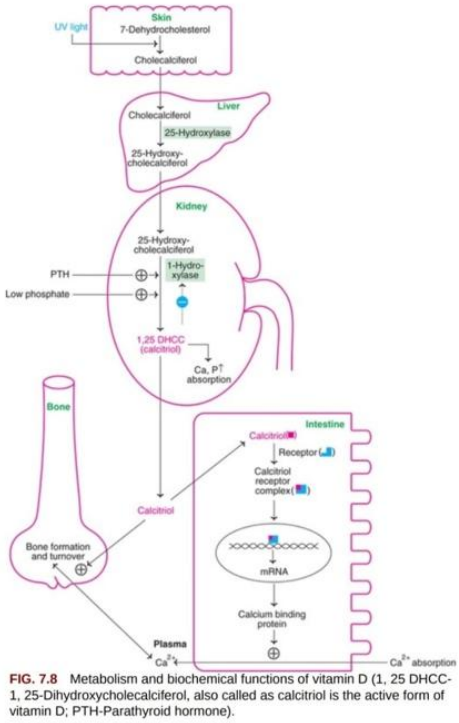


FIG. 7.8 Metabolism and biochemical functions of vitamin D (1, 25 DHCC-1, 25-Dihydroxycholecalciferol, also called as calcitriol is the active form of vitamin D; PTH-Parathyroid hormone).

Image source: Textbook of biochemistry by U. Satyanarayana, U. Chakrapani, 4th revised edition, 2013.

Synthesis of 1,25-DHCC: Cholecalciferol is first hydroxylated at the 25th position to 25-hydroxycholecalciferol (25-OH D3) by a specific hydroxylase present in the liver. 25-OH D3 is the major storage and circulatory form of vitamin D. The kidney possesses a specific enzyme, 25-hydroxycholecalciferol (calcidiol) 1-hydroxylase, which hydroxylates 25-hydroxycholecalciferol at position 1 to produce 1,25-dihydroxycholecalciferol (1,25 DHCC). 1,25 DHCC contains 3 hydroxyl groups (1,3 and 25 carbon), hence referred to as calcitriol. Both the hydroxylase enzymes (of liver and kidney) require cytochrome P_{450}, NADPH, and O_2 for the hydroxylation process.

Regulation of the synthesis of 1,25-DHCC: The concentration of 1,25-DHCC is regulated by plasma levels of calcium and phosphate. They control the hydroxylation reaction at position 1. Low plasma phosphate increases the activity of 25-hydroxycholecalciferol 1-hydroxylase. Low plasma calcium enhances the production of parathyroid hormone, which in turn activates 1-hydroxylase. Thus, the action of phosphate is direct while that of calcium is indirect on kidney 1-hydroxylase.

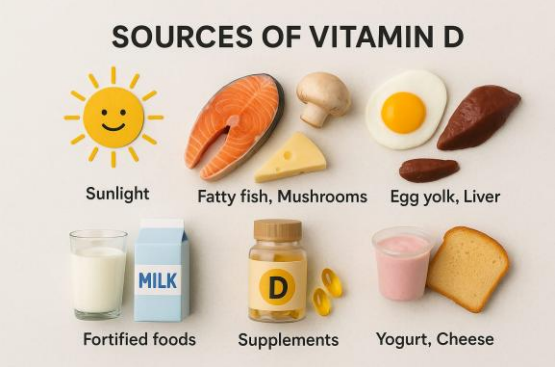
Biochemical functions:
Calcitriol (1,25-DHCC) is the biologically active form of vitamin D. It regulates the plasma levels of calcium and phosphate. Calcitriol acts at 3 different levels (intestine, kidney, and bone) to maintain plasma calcium (normal 9-11 mg/dl).
1. Action of calcitriol on the intestine: Calcitriol increases the intestinal absorption of calcium and phosphate. In the intestinal cells, calcitriol binds with a cytosolic receptor to form a calcitriol-receptor complex. This complex then approaches the nucleus and interacts with a specific DNA, leading to the synthesis of a specific calcium-binding protein. This protein increases the calcium uptake by the intestine. The Mechanism of action of calcitriol on the target tissue(intestine) is similar to the action of a steroid hormone.

2. Action of calcitriol on the bone: In the osteoblasts of bone, calcitriol stimulates calcium uptake for deposition as calcium phosphate. Thus, calcitriol is essential for bone formation. The bone is an important reservoir of calcium and phosphate. Calcitriol, along with parathyroid hormone, increases the mobilization of calcium and phosphate from the bone. This causes an elevation in the plasma calcium and phosphate levels.

3. Action of calcitriol on the kidney: Calcitriol is also involved in minimizing the excretion of calcium and phosphate through the kidney, by decreasing their excretion and enhancing reabsorption. The sequence of events that takes place in response to low plasma calcium concentration and the action of calcitriol on the intestine, kidney, and bone ultimately leads to an increase in plasma calcium. 24,25-Dihydroxycholecalciferol (24,25-DHCC) is another metabolite of vitamin D. It is also synthesized in the kidney by 24-hydroxylase. The exact function of 24,25-DHCC is not known. It is believed that when calcitriol concentration is adequate, 24-hydroxylase acts, leading to the synthesis of a less important compound, 24,25-DHCC. In this way, to maintain the homeostasis of calcium, the synthesis of 24,25-DHCC is also important.

Recommended dietary allowance (RDA): The expert committee of ICMR emphasizes the importance of outdoor physical activities as a means of achieving an adequate Vitamin D status in a tropical country like India. However, under minimal exposure to sunlight, particularly in certain urban groups, like 1-2 year old children, a specific recommendation of a daily supplement of 600 IU is suggested.[3]

Dietary sources:



Deficiency symptoms :
Vitamin D deficiency is relatively less common, since this vitamin can be synthesized in the body. However, insufficient exposure to sunlight and consumption of diet lacking vitamin D results in its deficiency.

Vitamin D deficiency occurs in strict vegetarians, chronic alcoholics, individuals with liver and kidney diseases or fat malabsorption syndromes. In some people, who cover the entire body (purdah) for religious customs, vitamin D deficiency is also observed if the requirement is not met through diet.

Deficiency of vitamin D causes rickets in *children* and osteomalacia in *adults.*
Rickets in children is characterized by bone deformities due to incomplete mineralization, resulting in soft and pliable bones and a delay in teeth formation. The weight-bearing bones are bent to form bow legs. In rickets, the plasma level of calcitriol is decreased, and alkaline phosphatase activity is elevated. Alkaline phosphatase is concerned with the process of bone formation. There is an overproduction of alkaline phosphatase related to more cellular activity of the bone. It is believed to be due to a vain attempt to result in bone formation.

In case of osteomalacia (adult rickets) demineralization of the bones occurs (bones become softer), increasing their susceptibility to fractures.[5]

INVESTIGATIONS

The diagnosis can be made by measurement of serum 25(OH)D. In patients with low 25(OH)D,

measurements of PTH, Serum calcium, phosphate and ALP should also be considered. Low levels of 25(OH)D in the absence of other abnormalities is unlikely to be of any clinical significance and in many cases is likely to be due to low levels of vitamin D binding protein, the levels of which are genetically determined. If low 25(OH)D levels are combined with raise levels of PTH, this is of more significance since it indicates secondary hyperparathyroidism, which if untreated and prolonged, may impair bone health and eventually lead to osteomalacia and rickets.[2]

CASE REPORT:
A 15 year old female who is an intermediate student approached to the clinic with the diagnosis of Vitamin D deficiency on 26/10/2024 with the following complaints:
Presenting complaints:
1. Irregular and profuse menses since 15 days
2. Weight gain since 6 months
3. Hair fall since 6 months
4. Pain in the neck since 6 months

Past History:
Frequent attacks of headache, used allopathic medications.
Generalized weakness-used supplements.

Characteristic Physical generals:
- Thirsty
- Desire for sweets
- Thermals: chilly patient
- Built: obese
- Complexion: Fair

Vital data:
Pulse rate: 68/min; Heart Rate: 72/min; Blood Pressure: 110/80 mmHg; Weight: 56 kgs; Height: 141 cms; BMI: 30.2 kg/m^2

Life space investigation:
Patient hails from a middle class family and her relationship with family is good. She was a topper from childhood in studies. Gets anxious when anticipating things. In anxiety she gets confused and cannot handle things.

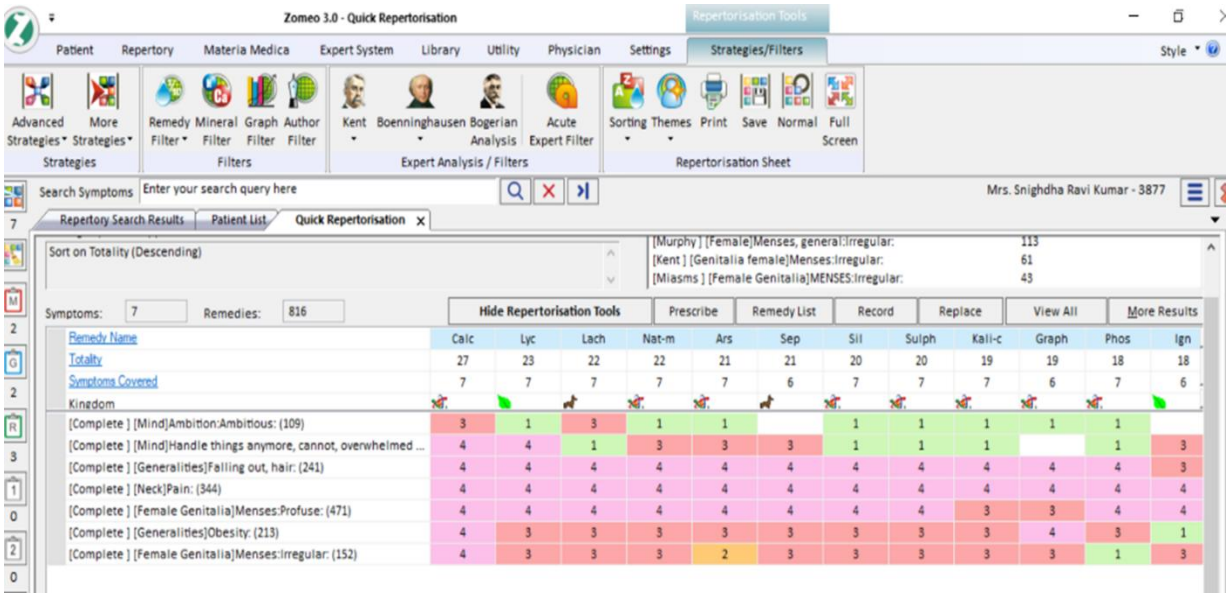
Diagnosis: k/c/o Vitamin D Deficiency with Menorrhagia.

Investigations performed: Serum 25-hydroxy vitamin D Total (D2 & D3) – 18.6 ng/ml
(performed on 25/10/2024).

Investigations advised: CBP, CUE, USG Abdomen & pelvis.

Case Analysis:
Totality of symptoms taken for prescription:
1. Cannot handle things, overwhelmed when
2. Ambitious
3. Hair fall
4. Irregular and Profuse menses
5. Pain in neck
6. Obesity

Repertorial Totality:



Remedies covered:
Calcarea carb, Lycopodium, Arsenicum album, Natrum muriaticum, Ignatia

Rx:

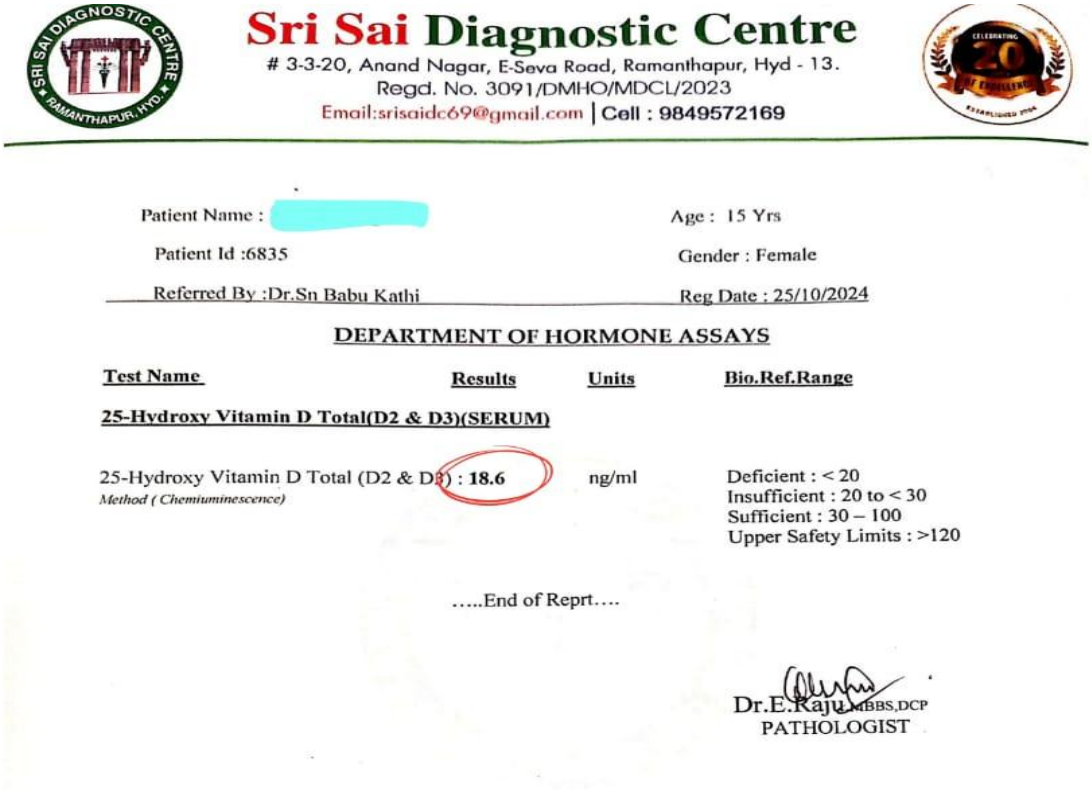
1. Calcarea Carb 200C, 1 dose
2. Rubrum – 1 month

General Management:
Advised specific diet plan and regular exercise.

Follow Up:

S.NO	DATE	COMPLAINTS	TREATMENT GIVEN
1.	27/11/2024	Profuse menses reduced Pain in the neck- better than before Generals- good Weight: 60 kgs Hair fall- same as before	RX: 1 Rubrum 200 3 doses 2 Thyroidinum30C 1 dose 3 Nihilinum 6/6 15 days
2.	12/12/2024	Pain in the neck reduced by 70% Weight: 58 kgs Hair fall- slightly reduced General activity: Feeling energised	RX: 1 Rubrum 6/6 1 month 2 Calc carb 200C 1 dose (SOS)
3.	13/01/2025	Patient used SOS medicine and Pain in the neck better than before Hair fall- Improved than before Generals- good Weight: 55 kgs Serum 25-hydroxy vitamin D Total (D2 & D3)- 34.1 ng/ml	RX: 1 Phytum 200 3 doses 2 SL 6/6 1 month

Before Treatment:



Sri Sai Diagnostic Centre
3-3-20, Anand Nagar, E-Seva Road, Ramanthapur, Hyd - 13.
Regd. No. 3091/DMHO/MDCL/2023
Email:srisaidc69@gmail.com | Cell : 9849572169

Patient Name : [redacted] Age : 15 Yrs
Patient Id :6835 Gender : Female
Referred By :Dr.Sn Babu Kathi Reg Date : 25/10/2024

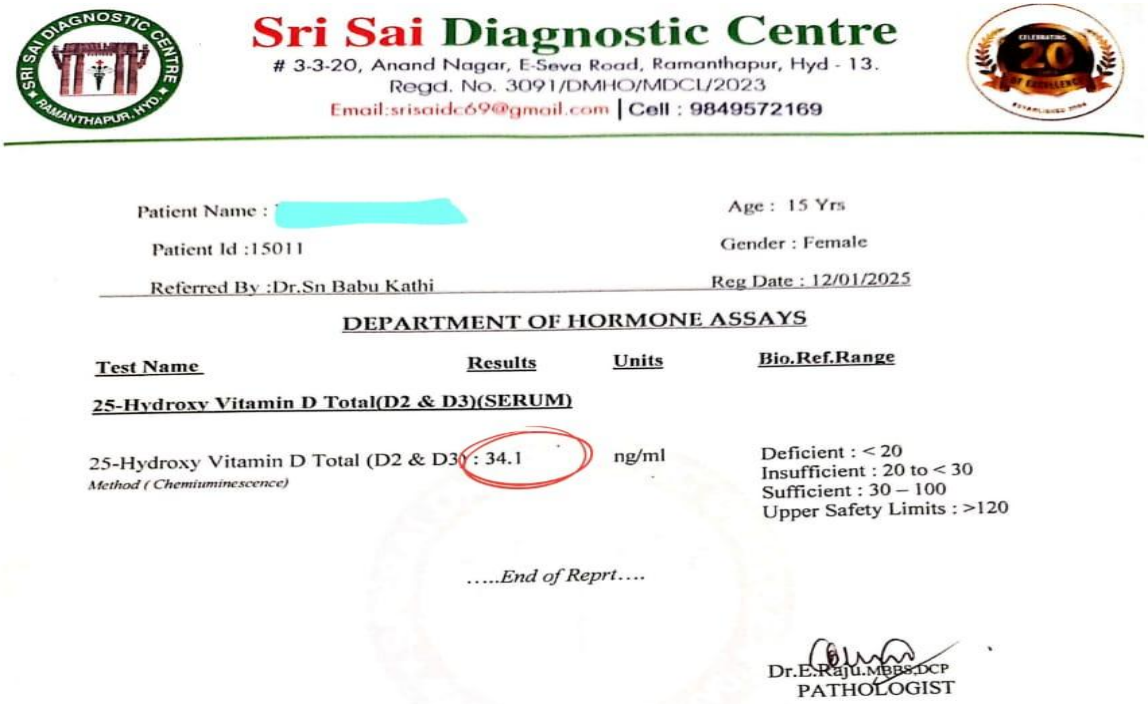
DEPARTMENT OF HORMONE ASSAYS

Test Name	Results	Units	Bio.Ref.Range
25-Hydroxy Vitamin D Total(D2 & D3)(SERUM)			
25-Hydroxy Vitamin D Total (D2 & D3) : *Method (Chemiuminescence)*	**18.6**	ng/ml	Deficient : < 20 Insufficient : 20 to < 30 Sufficient : 30 – 100 Upper Safety Limits : >120

.....End of Reprt....

Dr.E.Raju MBBS,DCP
PATHOLOGIST

After Treatment:



Sri Sai Diagnostic Centre
3-3-20, Anand Nagar, E-Seva Road, Ramanthapur, Hyd - 13.
Regd. No. 3091/DMHO/MDCL/2023
Email:srisaidc69@gmail.com | Cell : 9849572169

Patient Name : [redacted] Age : 15 Yrs
Patient Id :15011 Gender : Female
Referred By :Dr.Sn Babu Kathi Reg Date : 12/01/2025

DEPARTMENT OF HORMONE ASSAYS

Test Name	Results	Units	Bio.Ref.Range
25-Hydroxy Vitamin D Total(D2 & D3)(SERUM)			
25-Hydroxy Vitamin D Total (D2 & D3) *Method (Chemiuminescence)*	: 34.1	ng/ml	Deficient : < 20 Insufficient : 20 to < 30 Sufficient : 30 – 100 Upper Safety Limits : >120

…..End of Reprt….

Dr.E.Raju.MBBS.DCP
PATHOLOGIST

CONCLUSION

Homoeopathy offers a holistic approach in dealing with nutritional deficiencies. Several remedies, when selected based on the totality of symptoms, have shown promising outcomes in improving patient well-being and alleviating associated symptoms. Homoeopathic medicines are effective in curative, preventive, and promotive care without any adverse effects, as they are potentized and the minimum doses are capable of stimulating the autoregulatory process in the body.

ACKNOWLEDGEMENT

The authors would like to express sincere gratitude to Director Dr. Umesh Padmaja Akkaladevi, Principal Dr. Nurus Saher Khan, Hamsa Homeopathy Medical College, Hospital & Research Centre, Siddipet Dist, Telangana & Dr. Bhavya Shikha Associate Professor, Jims Homoeopathic Medical College, for their continuous support and encouragement.

Conflict of interest: The Authors declare no conflict of interest.

REFERENCE

[1] Aparna P, Muthathal S, Nongkynrih B, Gupta SK. Vitamin D deficiency in India. J Family Med Prim Care. 2018 Mar-Apr;7(2): 324-30.

[2] Ralston SH, Penman ID, Strachan MWJ, Hobson RP. Davidson's principles and practice of medicine. 24th ed. Edinburgh: Elsevier; 2023.

[3] Park k. Park's textbook of preventive and social medicine. 27th ed. Jabalpur: Bhanot Publishers; 2023.

[4] Jameson JL, Fauci AS, Kasper DL, Hauser SL, Longo DL, Loscalzo J. Harrison's principles of internal medicine. 24th ed. New York: McGraw-Hill Education; 2024.

[5] Satyanarayana U, Chakrapani U. Biochemistry. 4th ed. Kolkata: Elsevier; 2013.

[6] Homeopathic software zomeo 3.o