



Contents lists available at ScienceDirect

# Journal of Indian College of Cardiology

journal homepage: [www.elsevier.com/locate/jicc](http://www.elsevier.com/locate/jicc)



## Vitamin D levels and its supplementation in patients of heart failure

Md Talha Khan Abid\*, M.U. Rabbani, Asif Hasan, Sheelu Shafiq Siddiqi

JNMC, AMU, Aligarh, India

### ARTICLE INFO

#### Article history:

Received 4 September 2016

Accepted 30 May 2017

Available online xxx

#### Keywords:

Renin angiotensin aldosterone

Myocardial remodelling

Cholecalciferol

Radioimmunoassay

Echocardiography

Left ventricular

NYHA class

LVEF

LVESD

LVEDD

CAD

HHD

7-dehydrocholesterol

Ultraviolet radiation

### ABSTRACT

**Aim:** The aim of this study was to evaluate the association between vitamin D levels and echocardiographic parameters in patients with heart failure at baseline and after 12 weeks follow up. **Material and methods:** Seventy four out of eighty two patients with heart failure with vitamin D level <30 ng/ml and with NYHA class II or more were randomly divided into two groups. In Group I, patients received optimized medical therapy for HF and vitamin D supplementation of 60,000 IU weekly for 12 weeks. In Group II, patients received optimized medical therapy for HF. Statistical analysis was done using SPSS software 20.

**Results:** Two groups were similar in their baseline characteristics. Serum vitamin D levels (mean  $\pm$  SD) at baseline and after 12 weeks was  $18.14 \pm 6.07$  vs  $34.79 \pm 6.08$  in vitamin D supplemented group and  $20.48 \pm 5.86$  vs  $20.57 \pm 5.65$  in vitamin D non-supplemented group, respectively. Vitamin D supplementation significantly increased the vitamin D levels after 12 weeks of follow up. There was a significant improvement in echocardiographic parameters, however the extent of change from baseline did not differ significantly between the two groups.

**Conclusion:** Although vitamin D supplementation of 60,000 IU weekly for 12 weeks improves the serum vitamin D levels but it has no beneficial effects on improvement of left ventricular function. Trials with larger sample size and longer duration of follow up are needed to establish firmly or refute a causal relationship between vitamin D supplementation and changes in echocardiographic parameters.

© 2017 Indian College of Cardiology. All rights reserved.

### 1. Introduction

Heart failure (HF) is an increasingly prevalent health problem and is a major cause morbidity and mortality in elderly. It is a debilitating syndrome that leads to significant functional limitations. Heart failure patients, especially elderly, are prone to problems with nutrition because of various reasons. Also, decreased mobility leads to reduced sunlight exposure and therefore decreased synthesis of vitamin D.

Approximately 1 billion people worldwide have insufficient or deficient level of vitamin D.<sup>1</sup> On an average, approximately 5% of skin's surface area is exposed to sunlight, which results in approximately 14 ng/mL (35 nmol/L) production of serum vitamin D [25-dihydroxyvitamin D (25-OHD)].<sup>2</sup> Increasing time spent indoors, sunscreen use, age, darker pigmentation, extremes of latitude and seasonal variation contribute to decreased cutaneous synthesis and deficiency of vitamin D.<sup>1</sup> Vitamin D levels are

categorized by serum 25-OHD levels as deficient, insufficient, hypovitaminosis, adequate, and toxic.<sup>2</sup>

Vitamin D deficiency is of particular importance in patients with HF, as a growing number of studies have found increased prevalence of vitamin D deficiency in patients with congestive heart failure. It is evidence based that vitamin D deficiency is not a negligible laboratory finding in HF patients and there may be an intense association between these two clinical entities.<sup>3</sup>

Vitamin D is a hormone and is necessary for bone and muscle health. However, not only it acts on metabolism of calcium and phosphorus, it has some extraskeletal effects too.<sup>4,5</sup> Vitamin D receptors (VDRs) have been identified on the cardiac myocytes, vascular smooth muscle cells and juxtaglomerular cells of kidney.

It has been hypothesized that in HF patients, vitamin D supplementation may decrease symptom severity and disease progression through suppression of renin angiotensin aldosterone system and parathyroid hormone, decrease of blood pressure, downregulation of inflammatory mediators, promotion of cell growth and differentiation, suppression of myocardial remodeling and improvement in muscle strength.<sup>1,6-12</sup>

Therefore, a number of studies were conducted to evaluate the beneficial or detrimental effect of vitamin D on HF. However, the data is still lacking regarding the precise effect of vitamin D

\* Corresponding author at: Flat no. C1, Rehana Residency, Street no. 8, Dhorrah, Aligarh 202002, UP, India.

E-mail addresses: [drmdtalhakhnabid@gmail.com](mailto:drmdtalhakhnabid@gmail.com) (M.T.K. Abid), [rabbanimuin@yahoo.co.uk](mailto:rabbanimuin@yahoo.co.uk) (M.U. Rabbani), [asif\\_8796@rediffmail.com](mailto:asif_8796@rediffmail.com) (A. Hasan), [shafiqsheeluims@gmail.com](mailto:shafiqsheeluims@gmail.com) (S.S. Siddiqi).

supplementation on laboratory parameters as well as functional capabilities of patients with HF. Therefore, the present study was conducted to find out whether restoration of vitamin D would improve left ventricular geometry and function of HF patients.

## 2. Material and methods

The present study was a prospective, observational and comparative study conducted in the Department of Medicine, Centre of Cardiology and Rajiv Gandhi Centre for Diabetes and Endocrinology, J.N.M.C.H., A.M.U., Aligarh during 2014–2015 after getting approval from Institutional Ethics committee. A total of eighty two (82) patients attending medicine OPD, emergency, medicine IPD, CCU, Cardiology OPD of the J. N. Medical College and hospital, A.M.U., Aligarh were screened in this study after taking informed consent. Out of these seventy four (74) patients were found to have vitamin D deficiency or insufficiency and these were randomly divided into two groups (Fig. 1). Out of these, sixty two (62) patients completed the study. 30 patients receiving optimized medical therapy for HF and vitamin D supplements as group I and 32 patients receiving only optimized medical therapy for HF as group II. The inclusion criteria was heart failure patients with vitamin D level  $<30$  ng/ml and with NYHA class II or more. We excluded the heart failure patients with vitamin D level  $\geq 30$  ng/ml, hypercalcemia, nephrolithiasis, haemodialysis or peritoneal dialysis, serum creatinine concentration of  $>2$  mg/dl and patients taking

supplements containing vitamin D, calcium, corticosteroids, parathyroid hormone, androgen or estrogen.

After taking consent from patients, detailed history and physical examination was carried out on every subject. The examination included a thorough general examination, assessment of vital parameters and systemic examination. The patient was thoroughly investigated for following parameters: haemogram, liver function test, renal function test, lipid profile, serum electrolytes (Na, K, Ca,  $PO_4$ ), vitamin D, urine (routine & microscopy), ECG, echocardiography, CXR-PA View, BNP levels, Trop T/Trop I and CPKMB (if required).

Vitamin D<sub>3</sub> (cholecalciferol) 60,000 IU was supplemented weekly for 12 weeks in Group I along with the optimized medical therapy for heart failure, while in Group II, patients received the optimized medical therapy for heart failure but not the vitamin D supplements. Patients were followed regularly for adherence to therapy. Detailed history, physical examination and serum vitamin D levels, echocardiography and other relevant investigations (serum Ca,  $PO_4$ , BUN, creatinine, etc, if required) were done after 12 weeks of follow up.

Serum vitamin D was measured on fresh blood samples using radioimmunoassay test kit. 2D, M-mode and color doppler echocardiography were the imaging methods utilized on the echocardiography machine – ATL (A Philips medical system company) HDI 1500. Echocardiography was done on all the patients. Echocardiographic measurements were recorded

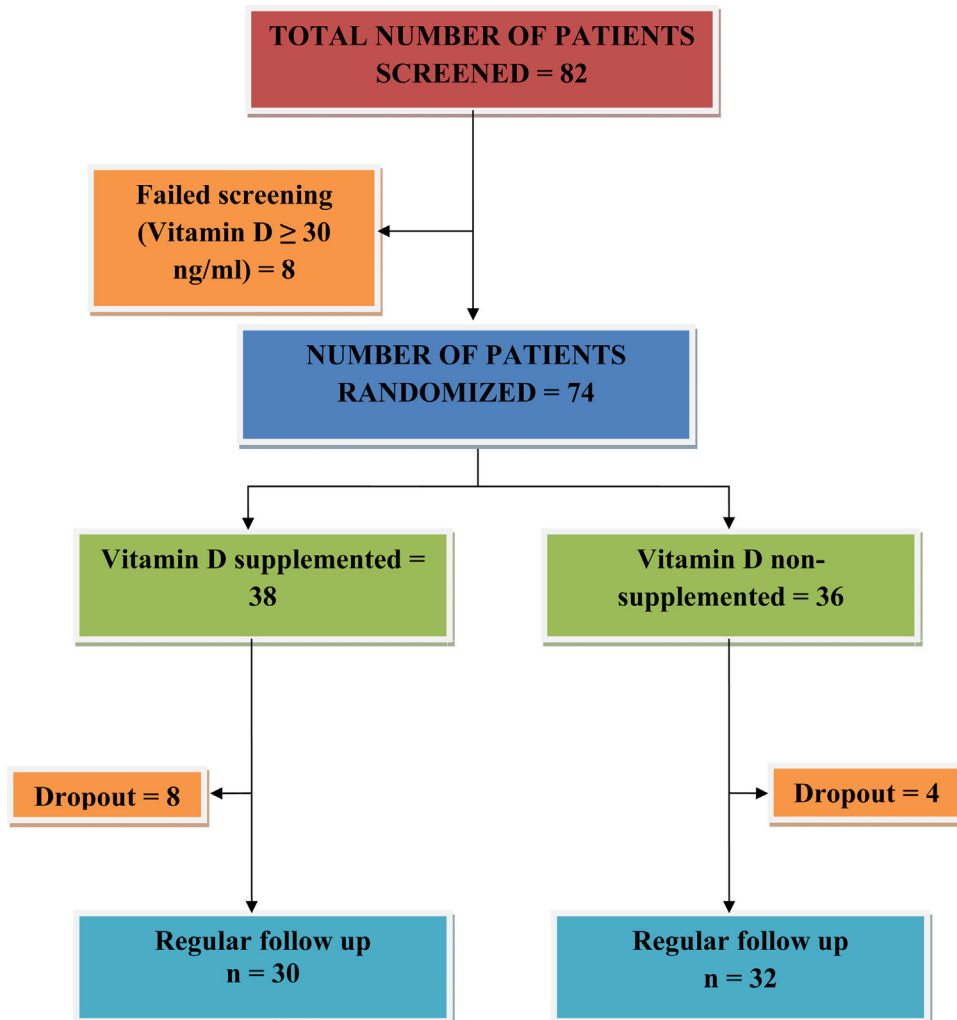


Fig. 1. Flow diagram of research design.

Download English Version:

<https://daneshyari.com/en/article/5616071>

Download Persian Version:

<https://daneshyari.com/article/5616071>

[Daneshyari.com](https://daneshyari.com)