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Original Research Article

Hypovitamanosis D and non cardiac chest pain

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ABSTRACT

Background: Recurrent atypical chest pain not due to cardiac illness is a very common condition in medical outpatient departments. Authors found that people consulting for atypical chest pain often have significant Vitamin D deficiency and correction of Vitamin D deficiency relieved patient symptoms. Hence authors carried out this study.
Methods: Persons aged below 50 years were taken up for study. Those attending medical clinics with complaints of chest pain occurring more than two times were taken up for study. Cardiac illness was excluded by clinical examination and investigations. Those found to have low Vitamin D were taken up for study. 60,000 international units Vitamin D was administered orally weekly for 8 weeks. They were followed up twice weekly for three months and once monthly for three months.
Results: Results were analyzed and charted. 120 subjects were taken up for study and duration of study was three years. Average age of the study group was 37.50 years and the average Vitamin D level was 15.75 nanogram/ml (ngm/ml). Duration of chest pain ranged from one week to one year. Most of the patients had migratory chest pain.
Conclusions: As Vitamin D deficiency is a treatable medical condition it may be prudent to check Vitamin D levels in the patients presenting with recurrent atypical pain in the chest. It reduces the burden on the health care system and relieves the suffering of the patient. It may not be futile to check Vitamin D levels even in the patients with coronary artery disease who are suffering from atypical chest pain.

Keywords: Coronary artery disease, Osteomalacia, Recurrent chest pain, Sunlight, Vitamin D deficiency

INTRODUCTION

The most common cause of Vitamin D deficiency is lack of exposure to sunlight. The prevalence of it is high globally.[1] Seventy percent of Vitamin D in humans comes from skin, made from 7-dehydrocholesterol under the influence of ultraviolet light from the sun. Thirty percent comes from diet.[2] Fatty fish, egg yolk, milk, liver and mushrooms are good sources of vitamin D in the diet. Malabsorption from gastrointestinal disease, hepatic and renal diseases may cause Vitamin D deficiency. Phenytoin, Phenobarbital, Carbamazepine, Oxcarbazepine, Isoniazid, Theophylline and Rifampin may increase the catabolism of Vitamin D leading to its deficiency. Regular application of sunscreen lotions may lead to deficiency in some individuals. Environmental pollutants block the ultraviolet rays contributing to Vitamin D deficiency even in people adequately exposed to sunlight.[3]

Vitamin D deficiency may cause various developmental problems in children but in adults milder deficiencies are asymptomatic. Osteomalacia, a clinical hallmark of Vitamin D deficiency may present with bone pain, muscle weakness, general malaise and fragility fractures. There may be muscle and bony pain on pressure and focal tenderness may be due to fissure fractures in ribs and pelvis.

Non cardiac chest pain is a common entity in clinical practice. Cardiac source of pain should be positively excluded by extensive investigations before considering non cardiac chest pain as a diagnosis. Gastrointestinal, pulmonary, musculoskeletal, rheumatological diseases,

herpetic infection in thoracocervical region, trauma, referred pain from other organs, drug abuse and psychological disorders all contribute to non cardiac chest pain. Pulmonary eosinophilia is a common cause of chest pain in tropical countries.

Vitamin D deficiency can also cause pain in the chest and can be a cause of recurrent pain in the chest. Although the fact was mentioned in earlier literature it was not studied extensively. Hence we took up this study to confirm that Vitamin D deficiency can cause recurrent pain in the chest and this pain can be abolished with supplementation of Vitamin D.

METHODS

Visakhapatnam is a metropolitan city in Andhrapradesh, India with a population of 30,00,000 surrounded by many villages and townships. Visakhapatnam is a medical hub for the surrounding population. People from neighboring states of Odisha, Madhya Pradesh and Jharkhand also utilise medical facilities in Visakhapatnam, India.

The study period was 15th May 2016 to 15th May 2019. Patients attending physician clinics with recurrent chest pain were included in the study. Two visits with atypical chest pain was taken as recurrent chest pain.

Persons aged below 50 years and above 15 years were taken up for the study. At the point of entry complete blood count, blood sugar, lipid profile, liver function tests, electrocardiogram (ECG), echocardiogram (ECHO), chest X ray, treadmill test (TMT) and the vitamin D assay were done. Those having lower levels of Vitamin D were selected into the study.

Vitamin D (Total 25-hydroxyVitamin D) was estimated from the plasma using the Electro-chemiluminescence immunoassay (ECLIA) by Cobas e analyser. Vitamin D of 30 ngm/ml was considered as normal. Persons having recurrent chest pain with less than normal Vitamin D levels were included in the study.

Vitamin D 60,000 international units was administered once a week orally for eight weeks. Vitamin D was estimated at the end of eight weeks and Vitamin D administered further depending on the level of Vitamin D. Tayo 60 K tablets containing cholecalciferol 60,000 units, manufactured by Eris life science Ltd were used in the study. They were followed up twice a month for initial three months and once a month for next three months.

Patients coming from other states and from distances farther than 100 km were excluded from the study with the view of the difficulties in follow up. Patients aged above 50 years and less than 15 years were not included in the study. Patients with chest pain suspicious of ischemic heart disease were omitted from the study. And patients with abnormal ECG, ECHO, TMT and Chest x ray were also excluded.

RESULTS

In the study period of three years, 120 patients were enrolled. 94 male and 26 females were included in the study (Figure 1). Average age of study populations was 37.50 yrs. Minimum age included was 15 years and maximum age was 50 years. Average Vitamin D value recorded in the study was 15.95ngm/ml and minimum value recorded was 4.40 ngm/ml and maximum was 29.30ngm/ml (Figure 2). Average Haemoglobin content of blood was 13.58 gm/dl indicating good nutritional status of the study group. The other diseases that were found out in the study group were Eosinophilia 8, Gastroesophageal reflux disease 2, Hypertrophic cardiomyopathy 1, Anaemia 3 and Gynecomastia 1.

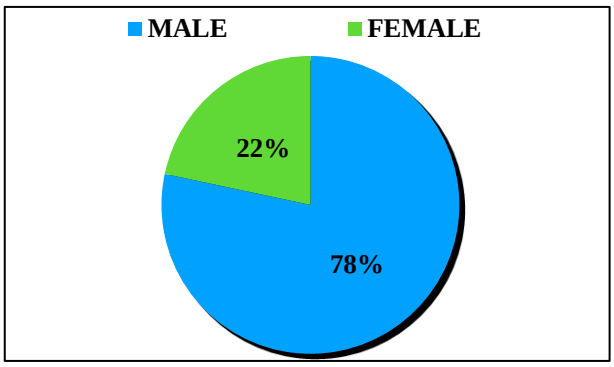

Figure 1: Sex distribution.

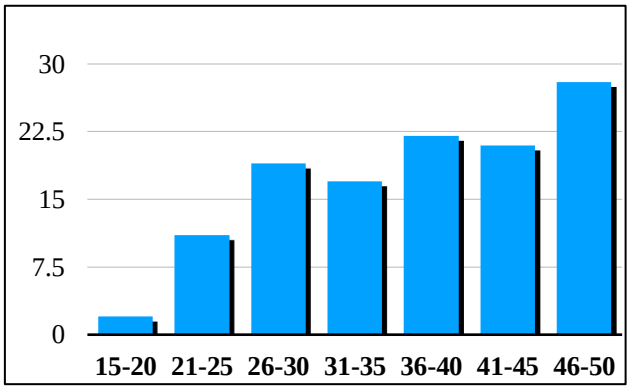

Figure 2: Age distribution of vitamin D deficiencies.

All the patients were followed up for a minimum of six months. They did not complain of chest pain during the study period.

DISCUSSION

Non cardiac chest pain (NCCP) or atypical chest pain is a term used to describe the pain unrelated to the heart. Prevalence is as high as 70% and may be detected in all levels of medical practice i.e. cardiologist, physician, general practitioner, emergency department and

hospitalized patients of all departments. Discomfort and disability produced by NCCP could be similar to cardiac chest pain. Uncertainty in the diagnosis may impact psychology of the patient. Further NCCP may recur in fifty percent of patients.[4] Epidemiological studies indicate the proportion of the NCCP is 20% to 40% among the patients reporting with chest pain. This proportion is comparable worldwide in different countries such as Europe, USA, Australia and China.[5] Gastroesophageal diseases accounts for 60% of NCCP and major contributor is reflux disease. Many pulmonary diseases may present with Non cardiac chest pain so are the musculoskeletal diseases. Drug abuse and psychological factors may precipitate NCCP. Herpes zoster of chest wall may mimic a myocardial infarction in the intensity of pain. Depression, somatization and fictitious disorders may present with atypical pain chest.[6] Many studies reported association of coronary artery disease with serum low Vitamin D levels.[7,8] Deficiency of Vitamin D has been implicated to influence coronary mortality negatively.[9] Association of low level of Vitamin D to a low HDL has been hypothesized.[10] In contrary monthly high dose vitamin D supplementation did not prevent coronary artery disease.[11] The Physical performance declined in elderly people and women with Vitamin D level less than 20ngm/ml.[12]

To date in the literature there are very few reports implying Vitamin D as a cause of NCCP.[13]

This study suggests that Vitamin D deficiency can cause recurrent chest pain, and correction of it abolishes it. And also it may improve physical performance of individuals.

CONCLUSION

As Vitamin D deficiency is a treatable medical condition it may be prudent to check Vitamin D levels in the patient presenting with recurrent atypical pain in the chest. It reduces the burden on the health care system and relieves the suffering of the patient. It may not be futile to check Vitamin D levels even in the patients of coronary artery disease who are suffering from atypical chest pain. Correction of Vitamin D deficiency may improve the physical performance of individuals.

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