## **ORIGINAL ARTICLE**

# Role of Vitamin-D in Fibromyalgia Development: Cross Sectional Study

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## ABSTRACT

**Background**: Fibromyalgia is a common condition characterized by long-term, body-wide pain and tender points in joints, muscles, tendons, and other soft tissues.

Aim: To assess the role of vitamin D in the development of fibromyalgia.

**Methodology:** A sample of 92 patients keeping confidence level equal to 95% and margin of error equal to 10% in the current study carried from March to August 2018 in the Department of Orthopedics, Allama Iqbal Hospital, Lahore after the approval from Hospital's Ethical Committee. Informed consent was taken at enrollment time. Serum vitamin D was done. Patients were treated with vitamin D with calcium at 1000mg daily dose. SPSS software, v22 analyzed the data.

**Results:** Out 92 patients, 58 (63.0%) were males and 34 (37.0%) were females. In 70 (76.1%) patients, pain affects/limit the daily routine. The mean calcium level was higher in patients with normal vitamin D levels as compared to vitamin D deficient groups with p-value of <0.05. **Conclusion:** It was concluded that there was deficiency of Vitamin-D and other bone metabolism markers among patients of fibromyalgia.

Keywords: Vitamin D, Fibromyalgia and Bone Metabolism Markers.

## INTRODUCTION

Pain is the most unpleasant sensation that has affected everyone globally. Fibromyalgia is one of them. Fibromyalgia is a medical condition that means muscle and connective tissue pain. It's a common health issue especially with growing age. It is characterized by chronic persistent widespread pain, chronic fatigue, sleep disturbance, and joint stiffness<sup>1</sup>. Many patients suffering from fibromyalgia present with mental illnesses like depression and anxiety<sup>2</sup>.

It usually involves many joints hence "fibromyalgia syndrome" is often used<sup>3</sup>. Recently, it emerged as a leading cause of joint and bone disorders. Its prevalence among western countries ranged from 2-7% with females: males as 9:1<sup>4</sup>. Data is scanty but revealed that among Asian population its prevalence is 2.1%, however the prevalence of combined rheumatic disorders turned out was 6.95%<sup>5</sup>.

This disorder has multiple reasons that included genetics, hormonal fluctuation, dietary insufficiency and chronic joint disorders along with use of chronic medictions. Stress, dopamine, serotonin and vitamin D deficiency played vital role in its development<sup>6,7</sup>. This disease has several consequences that include disability to perform routine activity, depression and anxiety. In the light of this increasing burden, we planned the current study to determine the role of vitamin D in the development of fibromyalgia

## METHODOLOGY

This cross sectional study with a sample of 92 patients keeping confidence level (95%) and margin of error (10%) was carried from March to August 2018 in the Department of Orthopedics, Allama Iqbal Hospital, Lahore after the approval from Hospital's Ethical Committee. Informed consent was taken at enrollment time. Serum vitamin D was done. Patients were treated with vitamin D with calcium at 1000mg daily dose. The inclusion criteria included both genders (28-65 years) with signs and symptoms of fibromyalgia were enrolled. Those who botched to fulfill inclusion criteria were ruled out<sup>8</sup>.

**Data Analysis:** The data were analysis by using SPSS 22. Mean  $\pm$ SD was given for age. Frequency and percentage were given for gender, vitamin deficiency. Chi square was used to determine the association of vitamin deficiency and fibromyalgia with P-value  $\leq 0.05$  as significant.

## RESULTS

In current project, mean age of all enrolled subjects was  $43.5 \pm 8.6$  ranging from 28-65 years. Baseline features of patients were depicted in Table-1.

Prevalence of fibromyalgia and vitamin D levels were presented in table-2.

There was significant association of Fibromyalgia score with vitamin D level. Patients with vitamin D deficiency had severe disability score. Results showed in table-3.

Serum Vitamin D and other bone metabolism markers levels of subjects were depicted in table-4 below. This showed relationship between them.

#### Table 1 Baseline Parameters Of Subjects

Variables	Categories	Frequency	Percentage
Conder	Male	58	63.0%
Gender	Female	34	37.0%
Painkillers/ Multivitamin	Yes	62	67.4%
	No	30	32.6%
Pain affects/limit the daily routine	Yes	70	76.1%
activity	No	22	23.9%

#### Table-2 Prevalence of Vitamin D and Fibromyalgia

Variables	Categories	Frequency	Percentage
Vitamin D	Deficient	23	25.0%
	Insufficient	42	45.7%
	Normal	27	29.3%
Fibromyalgia	Below average disability	20	21.7%
	Average disability	28	30.4%
	Severely disability	44	47.8%

#### Table-3 Vitamin D Association With Fibromyalgia & Daily Routine Activity

Variable	Categories	Fibromyalgia			n voluo
variable		Below average disability	Average disability	Severely disability	p-value
Vitamin D	Deficient	3	6	14	<0.001*
		13.0%	26.1%	60.9%	
	Insufficient	5	10	27	
		11.9%	23.8%	64.3%	
	Normal	12	12	3	
		44.4%	44.4%	11.1%	
Pain affects/limit the daily routine activity	Yes	12	24	34	0.116
		17.1%	34.3%	48.6%	
	No	8	4	10	
		36.4%	18.2%	45.5%	

Table 4: Vitamin D Levels And Bone Metabolism Markers Among Subjects

Vitamin D	Ν	Calcium, mmol/l	Phosphate, mmol/l	Alk Phos, U/I
Deficient	23	2.04 ± 1.12	$0.92 \pm 0.38$	80.5 ± 31.4
Insufficient	42	2.23 ± 1.04	$0.99 \pm 0.50$	78.5 ± 46.2
Normal	27	$2.74 \pm 0.94$	$0.94 \pm 0.44$	77.0 ± 37.5
P-value		0.044*	0.815	0.956

\* Significant P-value

### DISCUSSION

Current project, depicted association between vitamin D and fibromyalgia among enrolled subjects suffering from joint and muscle pain. Our results depicted that there is significant association between FMS and vitamin D levels with P-value of <  $0.001^*$ . This finding corresponded with the work done by one researcher, which found significant relationship with P-value of <  $0.05^8$ .

In present study both genders were enrolled with males (63%) in majority. Our method of enrollment was in line with one previous study with some modification who enrolled both genders as well but females were in majority<sup>9</sup>. Findings revealed that the mean calcium level was significantly higher in patients with normal vitamin D levels as compared to vitamin D deficient groups (table-4). Our findings corresponded with the findings of previous studies that a vitamin D deficiency causing fibromyalgia was mainly due to dietary deficiency as well as minimal sunlight exposure by patients<sup>10,11</sup>.

In present study, majority of the subjects were taking pain killers and had limited daily routine life activities of various grades. Our findings were in line with many previous studies that depicted similar results<sup>8,12</sup>.

**Limitations:** It was a single center study with a limited sample size and financial constrains.

## CONCLUSION

There was deficiency of Vitamin-D and other bone metabolism markers among patients of fibromyalgia. Hence concluded that Vitamin-D deficiency is linked with joint and muscle pain disorders like fibromyalgia that hampers routine life activities badly. Thus supplementation with Vitamin-D and calcium must be a routine in-order to overcome this illness

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