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RELATIONSHIP OF SERUM VITAMIN D LEVEL WITH ATRIAL FIBRILLATION AMONG YOUNG ADULT

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Abstract

Background:-
Vitamin D exposure has an important connection with cardiovascular disease in spite of its role in maintaining calcium as well as phosphate balance. AF generate a heartbeat that is not regular, which may trigger the heart to beat in excess of 150 times per minute. vitamin D is an antioxidant and an inflammatory mediator. It has been suggested that RAS has an influence in the onset of AF in people with comorbid disorders.

Objective:-
To gain insight of the correlation among serum vitamin D concentration along with the presence of paroxysmal atrial fibrillation (AF) in young adults.

Method: -
Patients presenting with arrhythmia symptoms were recruited from the Cardiology departments of Punjab Institute of Cardiology, Evercare Hospital, and Farooq Hospital in Lahore. Each patient initially underwent an Electrocardiogram (ECG) to identify abnormalities, specifically looking for signs of paroxysmal atrial fibrillation (AFib). If the ECG suggested paroxysmal AFib, the diagnosis was confirmed using 24-hour Holter monitoring to capture transient episodes.

Results:-
The mean age was 28.61±5.184 and graph show normal histogram curve with no skewness. The mean of Body mass index was 21.81±2.521 and graph analysis shows histogram curve with positive skewness. The mean of Resting heart Rate was 105.26±16.119 and graph analysis shows histogram curve with no skewness. Participants gender division showed that there were more men (61.0%)than women (36.6%). Participants with Dietary Vitamin D intake are slightly lower level (43.9%) than those who did not intake it (56.1%). The statistical analysis

shows that low serum vitamin D level relate with atrial Fibrillation.

Conclusion:-

It was conclude think there is a noteworthy correlation low Vitamin D concentration or increase incidence of atrial Fibrillation among young adults, reinforcing the belief that Vitamin D is essential in cardiovascular health , and its impact on electric function of heart. Our study Finding contribute that Vitamin D is essential in cardiovascular health, that regulating the heart electrical activity or having antileukoteric qualities , which may affect the risk of AF.

INTRODUCTION

Atrial fibrillation (AF) is the most prevalent arrhythmia that remains with time. It can be determine by a high rate of 400–600 beats per minute of delayed atrial cell depolarization, which results in chaotic ventricular rates and atrial contractile inefficiency.(1)

The most widespread recurring cardiac arrhythmia in the world is atrial fibrillation (AF), which has a projected lifetime incidence of twenty-one percent to thirty-three percent. As the population ages and the occurrence of AF related factors (which involves obesity and diabetes mellitus) increases, the number of Americans with AF is expected to reach over 12 million by 2030. It is especially regarding as expected increases in the burden of AF are connected to deaths from cardiovascular causes.(2)

AF generate a heartbeat that is not regular, which may trigger the heart to beat in excess of 150 times per minute. A heart that is functioning properly beats between 60 and 100 times per minute on average. (3) Paroxysmal atrial fibrillation (AF) is defined as At least two episodes of AF that recurrence episodes that self-terminate within 7 days episodes lasting up to 48 hours that are end with cardioversion (electrical or pharmacological) are also classified as paroxysmal AF. If AF persists for more than a year, it's considered enduring persistent AF.(4) About 35% of participants were not able to determine common symptoms of atrial fibrillation (AF), including dyspnea (30%) and low energy (35%). Several participants understand symptoms such as arm numbness (67%) and pain (71%) as signs of AF.(5)

The beginning of AF has been found to be significantly linked to a number of recognized cardiovascular risk factors, such as age, high blood pressure, congestive cardiomyopathy, heart valve disease, and hyperglycemia. sexual contact, weight gain, common drinking alcohol, and left ventricular hypertrophy are additional hazards. (6) First, a LA myopathy and an increase risk of AF are associated with many chronic systemic inflammatory (typically autoimmune) disorders. Secondly, An elevated incidence of atrial fibrillation (AF) is linked to a variety of metabolic diseases characterized by adipose tissue inflammation (7).

Limiting atrioventricular conduction is mostly completed via rate control through atrioventricular nodal blockade (as well as beta-blockers, Ca channel blockers, and digitalis). Nevertheless of the chronic treatment chosen, every patient with newly diagnosed AF should get appropriate ventricular rate control (as needed) at first. By maintaining sustained release, antiarrhythmic drug can help patients with problematic AF control the signs they have. .(8)

Vitamin D quantitative measure (ng/ml)*Paroxysmal atrial Fibrillation

The two Principal forms of vitamin D are ergocalciferol and cholecalciferol, though there are other forms as well. Specifically , the hormone vitamin D3 is created in the skin in response to ultraviolet (UV)B radiation and is also present in meals derived from animals., whereas vitamin D2 is primarily obtained through plant-based sources and supplements. .(9)

It is generally accepted that serum levels of 25(OH) D should be between 30 and 50 nanograms per milliliter (ng/mL). Generally speaking, concentrations of 20 to 30 ng/mL are seen as insufficient, and those with a concentration of <20 ng/mL as deficient. Vitamin D is essential for bone health because it helps control blood calcium levels and makes it simpler for the intestines to absorb

calcium.(10) There is a strong association between, according to several cross-sectional studies insufficient amounts of vitamin D and certain heart conditions, like Left ventricular hypertrophy, arterial stiffness, hypertension, and atherosclerosis(11)

According to recent studies furthermore , vitamin D might have pleotropic effects. Collagen remodeling and suppression of the Renin-Angiotensin system have been researched separately to identify routes linked to the etiology of AF.Additionally, it has been demonstrated that vitamin D is an antioxidant and an inflammatory mediator.(12)

A recognized predictor of death among individuals who have awful heart failure and arrhythmias of the atrium is high levels of atrial natriuretic peptide (ANP). (13) In general population, people with vitamin D deficiency had a slightly higher of creating AF contrasted to people together with normal vitamin D levels. In addition , there is only a 5% reduction in the risk of AF for each increase of 10 ng/ml in vitamin D. (14)

The United States Endocrine Society recommends that if want to keep the concentration of 25(OH)D above the optimal range of 75 Nmol/L, people ought to get 1500–2000 IU/d of vitamin D every day. The chance of nonvalvular AF was doubled for those who had mitigate concentrations of 25(OH)D then people with values more than 75 Nmol/L.(15)

Method :-

Patients presenting with arrhythmia symptoms were recruited from the Cardiology departments of Punjab Institute of Cardiology, Evercare Hospital, and Farooq Hospital in Lahore. Each patient initially underwent an Electrocardiogram (ECG) to identify abnormalities, specifically looking for signs of paroxysmal atrial fibrillation (AFib). If the ECG suggested paroxysmal AFib, the diagnosis was confirmed using 24-hour Holter monitoring to capture transient episodes. Following this diagnostic step, all patients, regardless of AFib status, had their serum Vitamin D levels measured through the Enzyme-Linked Immunosorbent Assay (ELISA) method. Patient demographic data, AFib status, and Vitamin D levels were documented and analyzed to explore the correlation between Vitamin D levels and the occurrence of paroxysmal AFib.

Results:-

The mean age was 28.61±5.184 and graph show normal histogram curve with no skewness. The mean of Body mass index was 21.81±2.521 and graph analysis shows histogram curve with positive skewness. The mean of Resting heart Rate was 105.26±16.119 and graph analysis shows histogram curve with no skewness. Participants gender division showed that there were more men (61.0%)than women (36.6%). Participants with Dietary Vitamin D intake are slightly lower level (43.9%) than those who did not intake it (56.1%).The statistical analysis shows that low serum vitamin D level relate with atrial Fibrilliation.Participants with low serum Vitamin D level are the more cause atrial Fibrillation than those who have high serum Vitamin D level. Low serum Vitamin suggest that link between serum vitamin D concentration or atrial Fibrillation.

1-Cross tabulation

Count				
		Paroxysmal atrial fibrillation		Total
		Symptomatic and confirmed diagnosed with PAFIB	Symptomatic but not diagnosed with PAFIB	
Vitamin D Quantitative measure (ng/mL)	Deficiency: < 20 ng/mL	30	2	32
	Insufficiency: 20-29 ng/mL	27	2	29
	Adequate: 30-100 ng/mL	3	16	19
Total		60	20	80

2-chi – square test :-

	Value	df	Asymptomatic Signifance(2 sided)
Person-chi square	46.59	2	.000

Discussion:-

The study evaluating Vitamin D concentration and there association between atrial Fibrillation among young adults revealed significant finding. The mean age of participant was 28.61±5.184 , with a mean body mass index was 21.81±2.521 and mean resting heart rate was 105.26±16.119 . Participants gender division showed that there were more men (61.0 ٪) than women (36.6٪) had experience paroxysmal atrial Fibrillation.

Our study's conclusion shows a nadir serum vitamin D concentration increase risk of paroxysmal atrial Fibrillation. Our results we obtained by E Belen , et al . something observed in severe heart attack individuals, a nadir plasma vitamin D level was closely linked to atrial fibrillation.(16) Studies that are currently available comparatively demonstrate a strong association with vitamin D and paroxysmal AF. Prior researches show that the connection with vitamin D or atrial fibrillation Yet , the connection between vitamin D and paroxysmal atrial fibrillation has not been specifically studied.(17)

Additionaly,our study shows that Low serum level Vitamin D concentration contribute in cardic remolding, altering hearts structure and increase the risk of atrial Fibrillation .Wei Luo, et al. conduct meta-analysis that shows that deficit serum 25-hydroxyVitamin D concentration are link with increased CVS morbidity and mortality.(18) D Papandreou, et al.conduct research that shows that Vitamin D deficiency could be the consequence cause of cardiovascular disease. (19).Furthermore a meta-analysis conduct by F Gholami ,et al that shows association between circulating 25-hydroxy Vitamin D and cardiovascular disease was also documented. (20) Vitamin D has antiviral and anti-inflammatory qualities properties that inhibit the RAAS and decrease the risk of atrial Fibrilliation.T Della,et al.conduct research that show the effect of Vitamin D on atrial Fibrillation.(21).P Acharya conduct research that investigate the link with Vitamin D supplementation and atrial Fibrillation .Vitamin D supplementation for at least 6 month use reduce the risk of atrial Fibrillation .(22).S Pilz conduct research that found that Vitamin D receptor (VDR) have protective effect on heart because they have antiatherosclerotic properties that decrease the incidence of CVS disease.(23).YH Chen conduct research that found that in patient with coronary artery disease deficiency with Vitamin D increase the incidence of creating atrial Fibrillation at that patient (24). Our study found that participants with Vitamin D level defficient <20ng/ml or insufficient 20-29ng/ml are more chance for develop atrial Fibrilliation.B Yamen,et al. conduct research that found that Vitamin D levels and AF recurrence following CV are strongly correlated. After CV, vitamin D insufficiency may indicate a greater incidence of AF recurrence, or vitamin D treatment during follow-up may aid in sinus rhythm maintenance.(25). We discovered that a considerably higher risk of AF was linked to underweight, overweight, and obesity.SH ,et al.conduct research that that found that discovered that underweight is just as much of a risk factor for AF as being overweight.(26).

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