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Research Article

CORRELATION BETWEEN LESION OF CORONARY ARTERY AND CHANGE IN CARDIAC FUNCTION IN ELDER PATIENTS SUFFERING FROM CORONARY HEART DISEASES

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Abstract:

Objective: This research work aimed is to analyze the association between abrasion of coronary artery and change in cardiac function among elder patients suffering from Chronic Heart Diseases.

Methodology: A sum of one hundred and seventy-one elderly patients suffering from Chronic Heart Diseases who got admission in the hospital from March 2012 to June 2019 were the part of this research work. We collected the data of ultrasonic cardiographs and coronary angiographic information of the patients and then we analyzed the association between abrasion of the coronary artery and remodeling of the left ventricular, diastolic & systolic function.

Results: There was a close relation between the lesion of the coronary artery among elder patients suffering from chronic heart diseases with the remodeling of the left ventricular & the change in the systolic function but it was not significantly associated with the change in the diastolic function.

Conclusion: The severity of the lesion of the coronary artery among elderly patients suffering from chronic heart diseases was a vital cause of remodeling of left ventricular and change of the systolic function. For the protection of the function of the heart, it is much important to carry early intervention for complications of coronary artery.

Keywords: Chronic Heart Diseases, Coronary, Angiographic, Lesion, Abrasion, Remodeling, Intervention.

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INTRODUCTION:

Chronic Heart Diseases is a very severe issue for the health of the human being. Developments in the field of drug treatments & coronary revascularization, there is extension in the life time of the patients but there is still an increase in the rate of the morbidity inducted due to cardiac insufficiency. The main factor affecting the prognosis of the patients suffering from chronic heart diseases is the change in the cardiac function. Through examining the association between the abrasions of the coronary artery and change in the cardiac function among elderly patients suffering from chronic heart diseases, we aimed to ensure the provision of medical basis for rationally suggesting regimens of treatment and for the determination of the prognosis.

METHODOLOGY:

A sum of total one hundred and seventy-one patients with elder age suffering from chronic heart diseases who got admission in our hospital from March 2012 to June 2019 were the part of this research work, including forty-nine females and one hundred and twenty-two males with a range of age from 60 to 85 years, of whom seventy-two patients were present with the past history of MI (Myocardial Infarction). All the patients were present with the data of ECG and CAD (Coronary Angiography). Other features resulting decline of LVEF, as Chronic Heart Diseases and valvar diseases of heart were not the part of this research work. Depending upon the testing of ultrasonic Doppler, the values of LVEF of sixty-two patients were less than 50.0%, showing the reduction in the systolic function of the left ventricular.

We arranged a well-designed questionnaire to record the associated data of the patients for through retroactive investigations. The echocardiography information of the patients, consisting LAD, FS, AOD, LVEDD & LVESD were recorded in the first week of the hospitalization of the patients in our hospital. We used the LVEDD as the main index to assess the remodeling of the left ventricular and LVEF less than 50.0% was in utilization as the index for the representation of the systolic dysfunction of the left ventricular. A combination of B-type ultrasound, pulse Doppler and color Doppler were in use for the detection of the E-peak & A-peak. Then we calculated the ratio of E/A as the index for assessing diastolic functions of the left ventricular. PHILIPS FD-20 digital subtraction angiography was in use for performing the CAG. SPSS V. 20 was in use for the statistical analysis of the collected information. Mean and SD (Standard Deviations) were used for the expression of the quantitative data. T test was in use for the comparison of the averages of both groups. Percentages were in use for the expression of the numerical data. For the analysis of the correlation of the numerical data, the utilization of the Pearson's correlation test carried out.

RESULTS:**Association between the GS (Gensini Score) as well as function and structure of left ventricular:**

For the elder age patients suffering from chronic heart disease, the association between GS and LAD, AOD, FS, LVEDD, LVEF & LVESD, FS, AOD, LAD and LVEF was much significant. The association among GS and ratio of E/A was not significant (Table-1).

Table-I: Correlation Between Gensini Score As Well As Left Ventricular Structure And Function.

Item	Correlation coefficient with Gensini score (r)	p
LVEDD	0.3300	0.0000
LVESD	0.1710	0.0320
FS	-0.3580	0.0000
AOD	0.2890	0.0000
LAD	0.2900	0.0000
LVEF	-0.4270	0.0000
E/A ratio	-0.0300	0.7380

After the exclusion of MI, association between GS and LAD, LVEDD, LVEF & AOD were present as statistically significant. However, there was no statistical significant correlation of the GS with the LVESD, FS or the ratio of E/A (Table-2).

Table-II: Correlation Between Gensini Score As Well As Left Ventricular Structure And Function After Excluding MI.

Item	Correlation coefficient with Gensini score (r)	p
LVEDD	0.3510	0.0020
LVESD	0.0580	0.6400
FS	-0.1820	0.1560
AOD	0.3290	0.0050
LAD	0.3020	0.0100
LVEF	-0.2640	0.0210
E/A ratio	0.1790	0.2240

The comparisons among groups present without or with history of MI: The groups without or with history of MI were present with the significant different FS, LVEF, LAD, LVEDD and AOD. But, their ratios of E/A were present as similar (Table-3).

Table-III: Left Ventricular Structures And Functions Of Groups With And Without MI History.

Echo Features	Group with MI history		Group without MI history		f	p
	No	Mean \pm SD	No	Mean \pm SD		
LVEDD	75.0	10.734 \pm 16.4680	93.0	5.377 \pm 5.8920	8.5010	0.0040
LVESD	68.0	4.814 \pm 5.4360	90.0	2.824 \pm 0.7400	11.8030	0.0010
FS	62.0	26.850 \pm 8.8950	90.0	37.910 \pm 8.4260	60.3910	0.0000
E/A ratio	48.0	0.801 \pm 0.3340	81.0	0.804 \pm 0.2900	0.0030	0.9600
LVEF	76.0	46.390 \pm 12.9760	94.0	66.100 \pm 11.9600	105.7300	0.0000
AOD	72.0	5.970 \pm 9.0250	89.0	3.650 \pm 4.9630	4.3050	0.0400
LAD	72.0	7.513 \pm 11.1690	89.0	4.276 \pm 5.6380	5.6880	0.0180

The comparison among groups without or with the decline of LVEF: The groups present without or with the decline of LVEF were present with significant different LVEDD, FS, LAD, LVESD and AOD (Table-4).

Table-IV: Left ventricular structures and functions of groups with and without LVEF decline.

Echo features	LVEF <50%		LVEF >50%		f	p
	No	Mean \pm SD	No	Mean \pm SD		
LVEDD	60.0	11.484 \pm 17.1310	108.0	5.705 \pm 7.3950	9.2990	0.0030
LVESD	53.0	5.356 \pm 6.0500	105.0	2.835 \pm 0.7270	17.8440	0.0000
FS	49.0	23.100 \pm 6.5210	103.0	38.300 \pm 7.6180	144.5490	0.0000
E/A	36.0	0.800 \pm 0.3540	93.0	0.803 \pm 0.2870	0.0030	0.9560
AOD	60.0	6.650 \pm 9.6610	101.0	3.520 \pm 4.7870	7.4840	0.0070
LAD	60.0	8.553 \pm 12.3320	101.0	4.403 \pm 4.8290	10.7710	0.0010

The involvement of the right coronary artery, participation of the interior descending branch, multi branch abrasions and exclusively occlusive coronary artery were different in both groups. But, the involvement of the main left coronary artery and the participation of the circumflex artery were similar in the both groups (Table-5).

Table-V: Coronary Artery Lesions Of Groups With And Without LVEF Decline

CAG result	LVEF <50%		LVEF >50%		I ²	p
	No	Percentage	No	Percentage		
Involvement of left vertical branch	8.0	13.560	10.0	9.170	0.7690	0.3800
Involvement of interior descending	59.0	96.720	88.0	80.730	8.5450	0.0030
Involvement of circumflex artery	46.0	75.410	68.0	64.150	2.2650	0.1320
Involvement of right coronary artery	52.0	85.250	69.0	63.890	8.7440	0.0030
Multi-branch lesion	56.0	91.800	75.0	69.440	11.1810	0.0010
Diffuse lesion	40.0	65.570	40.0	36.700	13.0910	0.0000
Entirely occlusive coronary artery	34.0	55.740	36.0	33.030	8.3280	0.0040

DISCUSSION:

Abrasions of coronary artery can affect the cardiac functionality through serious nature of acute ischemia. To decrease the consequence of the delayed cardiac dysfunction, specialists have been diagnosing factors like negative remodeling of ventricular, contraction of the left ventricular & diastolic abnormality. Among such factors, the severity of diseases of coronary artery has relation with the remodeling of ventricular and function of the left ventricular. Packer stated that morphological alteration of the remodeling of ventricular was easier as compared to the functional alteration of the anomalous hemodynamic. The remodeling of the left ventricle can increase the systolic dysfunction of the left ventricular. The decline of the LVEF means increase in the rate of death. The decline of LVEF in patients with older age with Chronic Heart Diseases is very severe, the lesion of vessel & complex lesions was much high as compared to the group of people with normal function of heart.

There was contribution of circumflex artery in 22.30% of ventricular & myocardial ischemia; which was much less than the anterior descending branch as 41.50% & right coronary artery as 36.20. Some conventional factors of risk for the CHs like the past history of the family for Chronic Heart Diseases, habit of cigarette smoking, history of PCI, past history of stroke and complete chronic closure were confirmed of not having any association with the left ventricular abnormality which may have relation to the enterprise of collateral circulation, ischemic pre-conditioning as well as ischemic post-conditioning.

Various research works have discovered that for the patients present with the angina pectoris and diseases of the coronary arteries, MI degree and the condition of the cardiac function determined the identification of the causes of complications. There may be

conduction of the relevant vascular revascularization for the improvement of prognosis. Large amount of the patients with elder age with congestive failure of heart but normal EF (Ejection Fraction) usually suffer from the diastolic abnormality. Ratio of E/A is mainly utilized parameter for the assessment of the diastolic function. Coronary diseases for long duration, fatness and HTN (Hypertension) can be the reason of MI, anoxia, and change in myocardial matrix, thereby affecting passive accommodation presentation & discouragement for the diastolic function. For the patients suffering from Chronic Heart Diseases in elder age, diastolic abnormality was much sensitive index as compared to the change in the systolic function. We also found that the lesion of the coronary artery in the elder patients suffering from Chronic Heart Diseases has no impact on their diastolic function. There is still need of more research works to determine the reasons for the change in diastolic function among patients of elder age suffering from Chronic Heart Diseases.

CONCLUSION:

The results of this research work confirmed that severity of the lesion of the coronary artery among elderly patients suffering from chronic kidney diseases was a vital cause for remodeling of the left ventricular and the change in the systolic function. There was not significant correlation of the lesion of coronary artery with the change in the diastolic function. It is significant in the medical work to progress the flow of blood myocardial tissue & prevent the remodeling of ventricular for the prevention of the heart failure. For the protection of the heart failure, it is very important to intervene timely in case of disease of coronary artery.

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