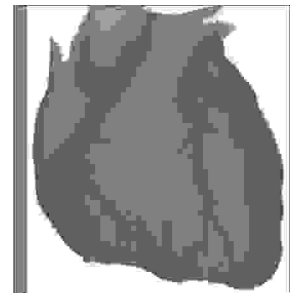


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VARIANT ANGINA; COMPARISON OF PATIENTS WITH AND WITHOUT FIXED SEVERE CORONARY ARTERY DISEASE



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ABSTRACT... drmsgilani@yahoo.com. **Introduction:** The syndrome of variant angina occurs in patients with a wide spectrum of coronary artery obstructions, ranging from normal coronary arteries to severe 3-vessel coronary artery disease (CAD). Treatment of these patients is, in large part, determined by the extent and severity of the underlying fixed coronary obstructions. **Objective:** To determine the clinical features of variant angina with and without fixed severe coronary artery disease. **Setting:** Nishtar Hospital, Multan. **Duration:** Two years. **Study design:** Descriptive, comparative analytical study. **Material & methods:** Sample size 108 patients. **Sampling technique:** Convenient probability sampling done. **Results:** 43 patients with variant angina who had less than 50% fixed coronary luminal diameter narrowing (group-I) were compared with 65 patients with variant angina who had 70% or greater diameter narrowing (group-II). Statistically significant differences were found in 3 clinical features between group-I and group-II i.e. (1) a more than 3 months history of angina at rest before diagnosis (80% vs 23%, $P < 0.001$); (2) an abnormal electrocardiogram at rest (19 vs 48%, $P < 0.01$). (3) an abnormal stress test (26% (8 of 30) vs 84% (15 of 18), $P < 0.01$). However, these features were not clinically reliable in separating patients with variant angina with and without fixed severe obstructions because of overlap between the two groups. No difference was found between the 2 groups in age, sex, predominant symptoms at the time of catheterization, history of exertional angina, syncope with angina, prolonged angina, previous artery disease. **Conclusion:** Coronary arteriography should be performed to define the underlying coronary anatomy and to determine optimal therapy in patients with variant angina.

Key words: Variant angina, with and without coronary artery disease.

INTRODUCTION

The syndrome of Prinzmetal's variant angina occurs in patients with a wide spectrum of coronary artery

obstructions, ranging from normal coronary arteries to severe 3-vessel coronary artery disease (CAD)^{1,2}. Treatment of these patients is, in large part, determined

by the extent and severity of the underlying fixed coronary obstructions. Patients with variant angina and fixed severe obstructions are often candidates for coronary bypass surgery. Those with mild obstructions usually respond to nitrates and calcium antagonists, whereas bypass surgery is usually ineffective. Two previous studies have suggested that these two groups of patients can be differentiated on clinical grounds^{1,2}. This study determines the clinical features of large number of patients with Prinzmetal's variant angina correlates with the severity of underlying CAD.

PURPOSE OF STUDY

To assess the value of coronary events reflected by changes in R-wave amplitude after exercise.

MATERIAL AND METHODS

108 patients were included in this study and was carried out in Nishtar Medical College during the period of two years.

Sampling technique

Convenient probability sampling done. Among 108 patients with Prinzmetal's variant angina who were included in this study. These patients met the following criteria for variant angina (1) recurrent episodes of angina at rest; (2) transient ST-segment elevation during spontaneous anginal attacks and (3) normalization of the ST segment between attacks without evidence of myocardial infarction. All patients underwent selective coronary arteriography and were separated into 2 groups. Group-I included patients with less than 50% fixed luminal diameter narrowing of the coronary arteries. Group-II included those with 70% or greater diameter narrowing of the artery that corresponded to the area of ST-segment elevation. Four patients were excluded who had an obstruction to the area of ST elevation. Five patients were excluded who had less than 50% obstructions in the artery that caused ST-segment elevation, but a severe obstruction in another artery. The ergonovine maleate provocative test for coronary artery spasm was performed and interpreted.

The length of history of angina at rest was determined from the onset of symptoms until the diagnosis of variant

angina was made. Angina pectoris was considered typical in quality and location if the pain was dull, burning, squeezing or pressing, and if it was located in the midsubsternal or parasternal area, shoulder or upper arm. Prolonged angina pectoris lasted 30 minutes or more without evidence of acute myocardial infarction, a history of myocardial infarction was determined on the basis of prolonged anginal pain accompanied by new Q-waves or typical evolutionary ST-T waves changes associated with an increase in cardiac enzymes. Major arrhythmias included asystole, high-grade heart block, and ventricular tachycardia or fibrillation. Nitroglycerin therapy was considered effective if 1 or 2 tablets relieved most anginal attacks within 10 minutes. Hypercholesterolemia was present if the serum cholesterol was above 250 mg/dl. Hypertension was present if the blood pressure was 150/90 mmHg or greater or if there was a history of treatment for hypertension. Stress testing was performed before cardiac catheterization. A chi square test was used to determine individual P values. When the frequencies were too small for a chi square test, P values were determined with Fisher's exact test. A P value ≤ 0.05 was considered significant.

RESULTS

The clinical manifestations of these two groups of patients were summarized in Table-I. Group-I included 21 women and 22 men, average age 48 years (range 23 to 75). Group-II included 21 women and 44 men, average age 52 years (range 33 to 71). The length of history of angina at rest before diagnosis was significantly longer in group-I. The mean duration of rest angina was 24 months in group-I and 3.5 months in group-II.

The electrocardiographic findings in these groups of patients are summarized in table-II. Thirty patients in group-I and 18 patients in group-II underwent stress testing. Abnormal electrocardiographic results at rest and abnormal stress results were found significantly more often in group-II.

An ergonovine maleate provocative test was performed in 31 patients in group-I and was positive in 97%. Spontaneous spasm with angina or transient ischemic

electrocardiographic changes were observed in 33% in group-I and 6% in group-II. In group II, 1-, 2- and 3-vessel and left main trunk CAD were found in 58%, 24%, 18% and 5% of patients, respectively.

Table-I. Clinical manifestations		
Trait	FREQUENCY OF TRAIT %	
	Group-I (n=43)	Group-II (n=65)
Male sex	51	68
>3 month history of rest angina	-	-
Initial symptoms	-	-
Exertional angina	20	30
Rest angina	72.5	58
Myocardial infarction	7.5	12
Predominant symptom at time of catheterization	-	-
Exertional angina	7	8
Rest angina	93	92
Exertional angina	33	46
Angina typical in quality and location	91	98
Syncope with angina	33	20
Prolonged angina	42	46
Previous myocardial infarction	19	26
Anterior	75	40
Inferior	25	53
Other	0	7
Risk factors	-	-
Hypercholesteremia	33	34
Hypertension	27	26
Smoking	77	63
<i>P<0.0001</i>		

Table-II. Electrocardiographic findings		
Trait	FREQUENCY OF TRAIT %	
	Group-I (n=43)	Group-II (n=65)
Electrocardiogram at rest	-	-
Abnormal	19	48*
Myocardial infarction	5	20
Location of ST elevation during angina	-	-
Precardial leads	25	35
Inferior leads	63	55
Other or not stated	12	10
Major arrhythmias during angina	37	28
Asystolia	7	2
2 or 3 heart block	16	8
Ventricular tachycardia or fibrillation	30	18
Stress test	-	-
Abnormal	27 (8of 30)	83 (15 of 18)*
ST elevation	13	28
ST depression	13	56
<i>P<0.01</i>		

DISCUSSION

This study was undertaken to determine if clinical manifestations correlate with coronary anatomy in patients with Prinzmetal's varying angina. We found a statistically significant P value difference in 3 clinical features between those with and without fixed severe obstructions (1) the length of history of angina at rest, (2) the frequency of an abnormal electrocardiogram at rest; and (3) the frequency of an abnormal stress test.

We found a significantly longer history of rest angina before the diagnosis of variant angina in group-I (mean

24 months) compared with group-II (mean 3.5 months). This observation suggests that the syndrome of Prinzmetal's variant angina follows a more chronic course in patients without fixed severe coronary obstructions. However, there is a large overlap between the two groups in the duration of history of angina at rest. This feature alone does not differentiate with and without fixed severe coronary artery obstructions.

Other investigators^{1,2,3} have suggested that among patients with coronary artery spasm, who have no fixed severe CAD are younger and are more frequently female than those with fixed severe CAD. However, we found no significant difference in the age or sex distribution with and without severe coronary obstructions.

In patients with variant angina, exertional angina might be expected to occur more frequently in those with than in those without severe underlying CAD. However, we found no significant difference in the frequency of exertional angina between these two groups. Hasdai et al⁴ reported 54 patients with variant angina with than in those without fixed severe disease (70% vs 36%, $P < 0.06$). However, their study included only 11 patients with coronary obstructions less than 50%. Bartholomew et al¹ found no effort angina in any of their 11 patients with Prinzmetal's variant angina who had normal or nearly normal coronary arteriograms. In studies that included larger numbers of patients with pure coronary artery spasm^{5,6}, exertional angina occurred in 23 to 45%, which is comparable to the 33% that we found in our group of 43 patients.

We found no significant difference in the frequency of hypercholesterolemia, hypertension or smoking history between our two groups of patients. Braunwald et al² also found no difference in the frequency of these risk factors in patients with and without severe coronary obstructions. This should not be surprising, because nearly all patients in our group without severe obstructions had at least mild underlying CAD. Coronary atherosclerosis is a substrate for spasm in almost all patients with variant angina.

We found a statistically significant difference in the frequency of abnormal electrocardiograms at rest in

group-I (19%) vs group-II (48%). During angina, ST elevation occurred more frequently in the inferior leads than in the anterior leads in both groups of patients. These findings emphasize the need to monitor both inferior and anterior leads during evaluation of patients with rest angina. Other investigators^{1,4} have found that ST-segment elevation occurs more frequently in the inferior leads in patients without severe obstructions, but in the anterior leads in those with severe obstructions. However, in our study, the location of ST elevation during angina did not differentiate patients with and without fixed severe obstructions.

We found abnormal stress tests in a significantly higher percentage of patients with severe CAD (83%) (15 of 18) compared with those without CAD (27% (0 of 30)). However, 1 major limitation of this study is that only 18 of the 65 patients with severe obstructions underwent a stress test. Our findings are similar to those of Mehta et al⁷, who compared patients with Prinzmetal's variant angina with mild versus severe obstructions and found positive stress test results in 38 vs 78%, Panagiotakos et al found positive stress tests in 46 vs 66 of comparable patients⁸. Therefore, an abnormal stress test in a patient with Prinzmetal's variant angina strongly suggests the presence of severe underlying CAD, but it does not reliably differentiate those with and without fixed severe coronary artery obstructions.

Patients with variant angina who have severe underlying CAD may benefit from coronary artery bypass surgery^{4,9,10,11}. In 1 group of 70 patients with variant angina and coronary artery obstructions of 70% or greater, 42 were randomized to medical and 37 to surgical therapy^{12,13}. There was no significant difference between the two groups with regard to mortality rate, myocardial infarction or severe angina pectoris in the first 2 years of follow up. However, 45% of the medically treated patients subsequently required coronary artery bypass surgery over the 3-year follow up period because of unacceptable angina pectoris. In contrast, coronary artery bypass surgery is generally unsuccessful in the treatment of Prinzmetal's variant angina in patients who have mild CAD, although the number of patients reported is small^{4,9}. In patients who present with variant angina,

knowledge of the coronary anatomy is important in the selection of therapy.

CONCLUSION

There was no difference in the location of ST elevation or occurrence of major arrhythmias during angina. Among patients with Prinzmetal's variants angina, those with normal or mildly abnormal coronary arteriogram cannot be differentiated reliably by clinical features from those with fixed severe coronary obstruction. Coronary arteriography should be performed to define the underlying coronary anatomy and to determine optimal therapy in patients with variant angina.

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