# Psychiatric Co-Morbidity Among Patients of Chest Pain Posted for Coronary Angiography

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**ABSTRACT**

**Introduction:-** Patients with chest pain of unknown etiology and negative coronary angiography show high anxiety, depression, neuroticism and thus higher prevalence of psychiatric co-morbidity. Current research objectives were to study the personality characteristics and psychiatric co-morbidity among patients of chest pain undergoing coronary angiography.

**Material and Methods:** 50 consecutive patients of chest pain posted for coronary angiography were assessed using Hamilton anxiety rating scale, Beck depression inventory, Indian adaptation of PEN inventory and psychiatric diagnosis was made by DSM IV-TR criteria.

**Results:** Out of 50 cases; coronary angiography positive group consisted of 37 patients with no sex predominance and coronary angiography negative group consisted of 13 patients with male predominance. Coronary angiography negative groups had shown high score on anxiety scale, depression scale and neuroticism. The psychiatric co-morbidity was high in coronary angiography negative patients predominantly anxiety spectrum disorder i.e Generalized anxiety disorder (15.38%).

**Conclusion:** The psychiatric co-morbidity was high among coronary angiography negative patients but carried good prognosis with timely psychiatric intervention.

**Keywords:** Coronary Angiography, Anxiety, Depression

## INTRODUCTION

Chest pain of unknown etiology is a common medical problem of concern for both patient and physician. After significant coronary artery disease is excluded, these patients have benign course. Unfortunately, from a functional point of view, many of these patients do poorly because they still believe they have heart disease, continue seeking medical care and are unable to work or enjoy normal activities. Furthermore, they are usually shuttled from one specialist to another in search of answers, since the physical and mental treatment of such patients demand a multispeciality work up. Studies have demonstrated that 10 to 30% of patients with chest pain who undergo coronary arteriography have no arterial abnormalities.[1-3] Follow up studies of these patients have consistently shown that the risk of subsequent myocardial infarction is low[4-10], yet 50 to 75% have persistent complaints of chest pain and disability after normal coronary angiogram.[6-8]

A brief review of history dating back to 1832, when Hope[11] discussed the subject of "nervous palpitation" in one of the first English textbooks of cardiology. Terms such as Da costa's syndrome, irritable heart, soldiers's heart, effort syndrome, neurocirculatory asthenia, hyper dynamic beta-adrenergic circulatory state, hyperventilation syndrome and mitral valve prolapse have been used to describe functional cardiac symptoms in patients.[12] Osler[13] recognized the difficulty in differentiating between chest pain caused by coronary artery disease and that attributable to non cardiac factors when he described two distinct categories of true angina and pseudo-angina. In the second category, he found patients with majority of females in whom episodes of pain were characteristically periodic and nocturnal, lasting one to two hours and accompanied by nervous symptoms and vasomotor distrubances.

In more recent years, Mayou[14] reported that in patients attending a cardiology clinic with chest pain those with no evidence of cardiac disease were characterized as being younger and describing more atypical chest pain and somatic anxiety symptoms than patients with demonstrable cardiac lesion. Woxler et al[7] estimated that 40% of 86 women with chest pain, who had normal coronary arteriogram, displayed neurotic and hypochondriac behavior. Many studies have found that anxiety- induced hyperventilation symptoms and non specific electrocardiographic ST and T wave changes were common in patients with chest pain and normal coronary angiography.[15-17] Elias and colleagues[18] found negative correlation between the maximum degree of coronary stenosis and measures of neuroticism(anxiety, depression and somatic complaints) in a sample of 136 men and women awaiting coronary arteriography. The more anxious, depressed, or concerned with somatic complaints the person was, the less coronary artery stenosis was demonstrated. In a group of 83 patients referred to coronary arterography for chest pain, Costa and colleagues demonstrated that neuroticism influenced the quality of the chest pain presentation, and that these symptoms did not predict arteriographic coronary stenosis.[19]

Channer and colleagues[20] assessed anxiety and depression by a short patients self rating scale in 87 consecutive patients with

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chest pain before diagnostic treadmill testing. Significantly more patients who had high scores on anxiety and depression had negative test results. Bass and Wade[21] studies 99 patients with chest pain referred to arteriography. Almost two third (61%) of the 46 patients with hemodynamically insignificant disease had a psychiatric diagnosis (most commonly anxiety neurosis) compared with 23% of 53 patients with significant coronary artery disease. Finally, Katon[22] reported that 39% of 55 patients referred for psychiatrist consultation by primary care physician who met the criteria of the Diagnostic and Statistical Manual of Mental Disorders Third Edition,(DSM III)[23] for panic disorder presented with chest pain and /or tachycardia.

Thus, these studies suggest that a person who scores high on neuroticism (anxiety and depression) often presents with somatic complaints in the absence of organic pathology and may contribute to the 10 to 30% of patients undergoing arteriography who are prone to have non-diseased coronary arteries. However, it is unclear whether patients with chest pain and negative coronary arteriograms have clinical syndrome i.e., major depression or panic disorder or simply have higher anxiety and depression score on psychological tests.

The brief review of literature on the subject indicates that the blind border zone of such type of patients if identified may thus be saved from undergoing unnecessary risky procedure of angiography. The recommendation of angiography to such patients further increases the anxiety about heart disease and if psychiatric treatment is added in to the treatment plan of such patients, the chances of recovery are very high.

Study objectives were to findout the psychiatric co-morbidity andcompare the personality characteristics in patients of chest pain undergoing coronary angiography.

## MATERIAL AND METHODS

### Sample

50 consecutive cases that have been posted for coronary angiography by the cardiologists of Halidram Moolchand Cardiovascular Centre Pbm Hospital, S.P. Medical College Bikaner between January 2012 to June 2012 were assessed. The serious patients and emergency cases as confirmed by the cardiologist were not taken for exhaustive psychiatric interview.

### Tools

1. Specially designed pro forma for the study to record socio demographic variables.
2. Hamilton anxiety rating scale (Hamilton M, 1995)
3. Beck depression inventory (Beck AT et al 1965)
4. Indian adaptation of PEN inventory(Menon and Verma 1988).
5. Diagnosis by DSM IV-TR criteria.

### Technique

50 patients who were posted for coronary angiography by the cardiologist were taken for the study; the informed consent was taken. The socio demographic variables were recorded in a specially designed performa and each patient

was subjected to various tools mentioned above. The result of the angiography of these patients was inquired later on from the angiography section to make this study double blind. These patients were further examined after 2 hours of the disclosure of angiography report especially for anxiety score on test to find out the effect of disclosure of report. The patients with block more than 50% in major coronary vessels in angiography was taken as coronary angiography positive case and less than 50% was taken as coronary angiography negative. The data's obtained was analyzed statistically.

## RESULTS

In our study the patients were divided into two groups based on coronary angiography as coronary angiography positive and coronary angiography negative. Table 1 depicts the age wise and sex wise distribution of the patients. coronary angiography positive group consisted of 37 patients with almost equal number of men and women (19 and 18 respectively) of mean age 47.48 (±5.63) years whereas coronary angiography negative group consisted of 13 patients out of which males were 8 (61.5%) and female were 5(38.5%) with mean age 42.31(±4.98) years.

The mean anxiety scores in Max Hamilton Anxiety scales (table2) before and after angiography in our study was found higher in coronary angiography negative group(20.38±2.90 and 19.31±2.95 respectively) as compared to coronary angiography group (15.67±3.97 and 16.54±3.84 respectively). The mean anxiety score in coronary angiography negative group two hour after angiography after revealing the result was 19.31 which was less than that from before angiography but more than coronary angiography positive group i.e 16.54. the coronary angiography negative group shows statistically significant high score than coronary angiography positive group.

The mean depression scores in Beck's depression (table 2) in the coronary angiography negative group was 20.15(±2.91) as compared to coronary angiography positive group were score was 15.08(±3.34) with p value <0.0001 showing the statistically significant higher score in coronary angiography negative group.

Table 3 shows the personality profile on PEN inventory in which patients belonging to coronary angiography positive groups show high score in Extraversion(n=19, 51.3%) followed by neuroticism (n=16,43.3%) and low score in

| Variables | Coronary angiography positive group (n=37) | Coronary angiography negative group (n=13) | P value |
|---|---|---|---|
| Age in years | | | |
| 30-40 | 3 | 5 | 0.005 |
| 40-50 | 20 | 7 | |
| 50-60 | 14 | 1 | |
| Mean Age | 47.48±5.63 | 42.31±4.98 | |
| Sex | | | |
| Male | 19 | 8 | 0.526 |
| Female | 18 | 5 | |
| **Table-1:** Age and sex wise distribution of patients | | | |

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| Variables | Coronary angiography positive group (n=37) | Coronary angiography negative group (n=13) | Comparison | P value |
|---|---|---|---|---|
| Hamilton Anxiety rating scales | | | | |
| Before Angiography | 15.67±3.97 (A) | 20.38±2.90 (B) | A vs B | 0.0003 |
| | | | C vs D | 0.0223 |
| After Angiography | 16.54±3.84 (C) | 19.31±2.95 (D) | A vs C | 0.0001 |
| | | | B vs D | 0.0059 |
| Beck's Depression Inventory | | | | |
| Before Angiography | 15.08±3.34 | 20.15±2.91 | | <0.0001 |
| **Table-2:** Scores on hamilton anxiety rating scales and Beck's depression inventory | | | | |

| Variables | Coronary angiography positive group (n=37) | Coronary angiography negative group (n=13) |
|---|---|---|
| Psychoticism | 2(05.4%) | 1(07.7%) |
| Extraversion | 19(51.3%) | 3(23.1%) |
| Neuroticism | 16(43.3%) | 9(69.2%) |
| **Table-3:** Personality profile on PEN Inventory | | |

| Diagnosis (DSM IV) | Coronary angiography positive group (n=37) | Coronary angiography negative group (n=13) |
|---|---|---|
| Generalised anxiety disorder | 1 (2.70%) | 2 (15.38%) |
| Depression | 2 (5.40%) | 1 (7.69%) |
| Dissociative (conversion) disorder | 1 (2.70%) | 1 (7.69%) |
| Somatization disorder | 1 (2.70%) | 0 |
| Panic attack without agoraphobia | 0 | 3 (23.07%) |
| Total | 5(13.5%) | 7(53.83%) |
| **Table-4:** Point prevalence of psychiatric co-morbidity | | |

Psychoticism (n=2,5.4%); whereas in coronary angiography negative group patients shows high score in neuroticism (n=9,69.2%) followed by extraversion(n=3,23.1%) and low score in psychoticism(n=1,7.7%).

Table 4 depicts the Psychiatric co-morbidity among the patients who were studied. In coronary angiography negative group 7(53.83%) patients had psychiatric comorbidity out of which 3 patients(23.07%) had panic attack without agoraphobia,2 patients(15.38%) had generalized anxiety disorder and 1 patients(7.69%) each of depression and dissociative disorder. The coronaray angiography positive group had 5 patients (13.5%) with psychiatric comorbidity out of which 2 patients (5.4%) had depression and 1 patient each of generalized anxiety disorder, depression and dissociative disorder.

## DISCUSSION

In our study coronary angiography positive group had almost equal number of men and women (19 and 18 respectively) with mean age 47.48 years whereas coronary angiography negative group consisted of two-third men (61.5%) with mean age 42.31 years as compared to Valkamo M et al[24] where coronary angiography positive group included more men and were average older then patients of coronary heart

disease negative on coronary angiography.

The mean anxiety scores in Max Hamilton Anxiety scales before and after angiography in our study was found higher in coronary angiography negative group (20.38 and 19.31 respectively) as compared to coronary angiography group (15.67 and 16.54 respectively). Katon W et al[22] and Cormier LE et al[25] found that the patients in the normal coronary angiography group had significantly higher anxiety scores than patients in the coronary artery disease group.

The mean anxiety score in coronary angiography negative group two hour after angiography after revealing the result was 19.31 which was less than that from before angiography but more than coronary angiography positive group i.e 16.54. This can be explained by the fact that after knowing the result of the angiography there was some improvement of the apprehension anxiety. But the overall mean score of the anxiety of coronary negative group was more than that of coronary positive group giving evidence that the perception of chest pain is more in anxiety prone person.

The mean depression scores in Beck's depression inventory was higher in the coronary angiography negative group (20.15) as compared to coronary angiography positive group (15.08) in comparison to Lantinga L J eat al[26] study patients in normal coronary angiogram group scored significantly higher than coronary artery disease group on Beck Depression Inventory (p<0.007).

In our study patients of coronary angiography negative group show high neuroticism score(69.23%) than coronary angiography positive group(43.24%) which is consistent with the finding of Bass et al[21] where patients with insignificant coronary lesion had higher scores of neuroticism than patients with significant coronary lesions.

Psychiatric co-morbidity in coronary angiography negative group was four times higher (53.83%) as compared to coronary angiography positive group (13.5%). Anxiety spectrum disorder i.e. Panic attack without agoraphobia (23.075) and generalized anxiety disorder (15.38%) were mainly present in coronary angiography negative group as compared to depressive disorders in the coronary angiography positive group (5.4%). It has been found in several studies that chest pain patients with healthy coronary arteries exhibit more psychiatric illness than those with definite coronary heart disease. The most common disorder identified was panic disorder, although other illnesses such as depression, hypochondriacal disorder, somatization disorder and generalized anxiety disorder[27] were not uncommon.

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## CONCLUSION

From this study it is evident that patients of coronary angiography negative group have high psychiatric co-morbidity which if intervened on time will avoid unnecessary risky procedure of angiography. The recommendation of angiography to such patients further increases the anxiety about heart disease and if psychiatric treatment is added into the treatment plan of such patients, the chances of recovery are very high.

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