

## Clinical study and analysis of depression and anxiety in patients after cardiovascular interventional therapy and its medical management

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**Abstract:** This article investigates the prevalence of depressive disorder in patients with coronary heart disease after coronary intervention and its clinical prognosis. Depression scores were scored in 520 patients with PCI before 2 weeks for using 24 Hamilton Depression Scales after surgery. The depression group (HAMD $\geq$ 21 points) and non-depression group (HAMD $<$ 21 points) were classified according to the 2-week depression score. And 12 months of clinical follow-up of the two groups of patients after discharge were studied. The results showed that 102 patients (25.5%) met the diagnostic criteria for HAMD depression before surgery, and 154 patients (38.5%) met the diagnostic criteria 2 weeks after surgery. The prevalence of depression after PCI was significantly higher than that before surgery. In the 12 months after discharge, postoperative depression occurred in 31 patients (20.1%) with MACE, which was significantly higher than those without depression. Logistic multivariate regression analysis showed that depression status was an independent risk factor for 12-month MACE in patients after PCI (OR 2.32, 94% CI 1.22 to 4.28, P=0.034). A higher proportion of patients with PCI have different degrees of depression. Postoperative depression is an independent risk factor for MACE in patients after PCI.

### 1. Introduction

With the prolongation of human life expectancy, the incidence of cardiovascular diseases such as coronary heart disease is increasing year by year [1-2]. Studies have shown that depression is an independent predictor of acute myocardial infarction and long-term adverse cardiovascular events (MACE) in patients undergoing coronary artery bypass grafting [3].

Through investigation and analysis, the incidence of depression includes correlation analysis of self-factors: (1) age and gender factors: in the age group of 50 years old, 50-59 years old, 60-69 years old, 70-79 years old, 80 years old or older, the prevalence of depression is 40.1%, 61.2%, 60.6%, 60.9% and 63.7%, the age difference was not statistically significant, with the increase of age, the prevalence of depression did not increase significantly. Among them, male depression accounted for 62.4%, and female accounted for 61.8% [4]. There was no significant difference in the prevalence of depression between men and women [5]. (2) Retirement income and education level factors: monthly income is between 1,000 and 3,000 RMB, and the prevalence of depression is 61.2% to 49.7%. For undergraduate college, junior college, high school, junior high school to primary school education background, the morbidity rates were 43.1%, 45.2%, 48.1%, 49.7% and 67.1%, respectively [6]. The above differences were statistically significant. The results showed that as the income increased and the level of education increased, the prevalence of depression decreased, as shown in Table 1, Figure 1, Table 2 and Figure 2.

Table 1 Incidence of depression in different age groups

Generation	Under 50 years old	50-69 years old	60~69 years old	70-79 years old	Over 80 years old
Incidence rate	40.1%	61.2%	60.6%	60.9%	63.7%

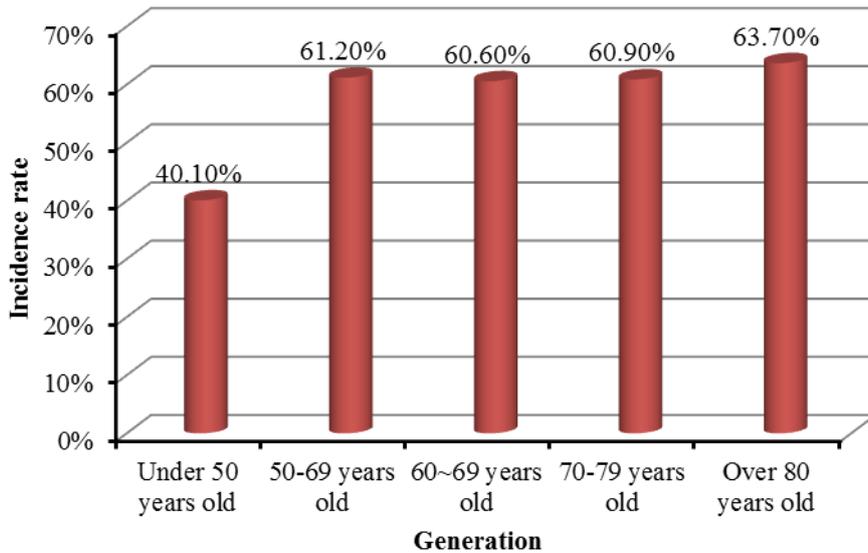


Figure 1 Incidence of depression in different age groups

Table 2 Incidence of depression at different educational levels

Cultural education	Undergraduate education	College education	High school education	Junior school education	Primary education
Incidence rate	43.1%	45.2%	48.1%	49.7%	67.1%

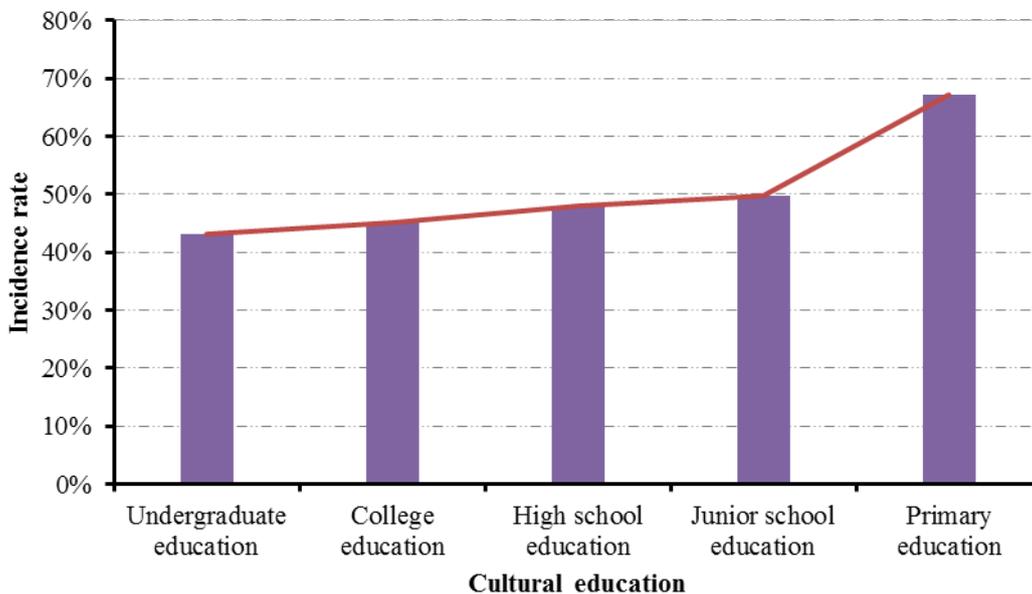


Figure2 Incidence of depression at different educational levels

## 2. The Mechanism of Depression and Anxiety on Coronary Heart Disease

### 2.1 Increased Platelet Activity

Increased platelet activity is one of the hypothetical mechanisms that explain the link between psychological factors and coronary heart disease. A recent meta-analysis of researchers found evidence of depression increasing platelet activity in the coronary heart disease group. People with anger and chronic psychological stress have been found to have stronger platelet activity and increased duration of platelet activity [7].

## 2.2 Inflammatory Response

Inflammatory factors are associated with the formation of atherosclerosis and are one of the major causes of coronary heart disease. C-reactive protein (CRP), interleukin-6 (IL-6) and interleukin-1 (IL-1) are independent risk factors for cardiovascular disease. Compared with the control group, patients with depression have higher concentrations of CRP, IL-6 and tumor necrosis, showing a persistent inflammatory state [8].

## 2.3 Heart rate Variability

Heart rate variability reflects the balance between the sympathetic system and the vagus system. It is a measure of the heart's ability to respond to physiological needs. Increased heart rate variability is associated with positive emotions, good social relationships, and longevity. The reduction in HRV is associated with depression, anxiety, coronary heart disease and death, which may be due to poor anticholinergic effects of cholinergic [9].

## 2.4 Behavioral Medicine Theory

From the perspective of behavioral medicine, depressed patients are more likely to stay away from healthy behaviors. And they have more disease behaviors and lifestyles. From the behavioral point of view, depressed patients have poor medication compliance, high smoking rate, more dietary fat intake. And they are lack of sedentary behavior with higher exercise habits [10].

## 3. Follow-up and clinical study of cardiovascular coronary intervention

### 3.1 Research methods

The Hamilton Anxiety and Depression Scale was compiled by Hamilton in 1960 and is a classic anxiety and depression rating scale, as shown in Figure 3, which has been recognized. The scale approximates the diagnostic scale of anxiety and depression and can better reflect the severity of anxiety and depression. Most of HAMD's projects use a 5-level scale of 0~4 points: 0 no, 1 mild, 2 moderate, 3 severe and 4 heavy. All the selected patients were treated with 24 HAMD for depressive disorder scores 1 day before surgery and 2 weeks after surgery. The total score (<8 points) was normal, and the total score (8 to 20) points may have depression. The total score was (20~35 points) must have depression, the total score (>35) is divided into severe depression. In this study, a total score of 20 or more was diagnosed as depression.

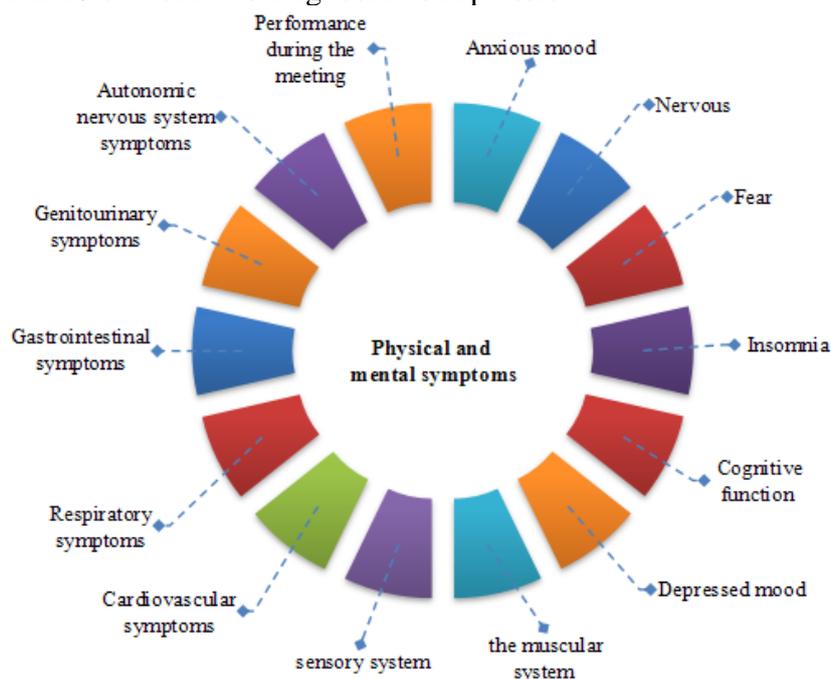


Figure 3 The measurement index corresponding to the Hamilton Anxiety and Depression Scale

### 3.2 Sample Selection and Research Results

(1) Relationship between depression and prognosis: All of the 520 patients completed clinical follow-up for 12 months, and the follow-up rate was 100%. Table 3 shows the clinical follow-up results of the two groups of patients.

Table 3 Cumulative incidence of adverse events at 12-month follow-up in both groups

	Total (520)	Depression group (200)	Non-depression (280)	The value of P
Total MACE	60 (11.5%)	36	21	<0.001
death	12 (2.3%)	9	5	0.040
Myocardial infarction	18 (3.5%)	12	8	0.045
TLR	29 (5.6%)	16	13	0.035

(2) Multivariate analysis: Logistic multivariate analysis showed that depression and type 2 diabetes, moderate to severe renal insufficiency were independent risk factors for MACE in patients with coronary heart disease undergoing PCI, as shown in Table 4.

Table 4 Logistic multivariate regression analysis of independent risk factors for total MACE at 12 months

Independent risk factor	Odds ratio (95%)	The value of P
Depression	60 (11.5%)	<0.001
Type 2 diabetes	12 (2.3%)	0.040
Moderate to severe renal insufficiency	18 (3.5%)	0.045

### 4. Conclusion

In short, with the development of society and the accelerated pace of people's life, the incidence of comorbidity of coronary heart disease has increased year by year, especially in the perioperative period of coronary intervention, which is often manifested as depression or anxiety, or even coexist. The physical symptoms of depression/anxiety are similar to the symptoms of angina and often mislead the cardiologist to make a correct diagnosis of the disease. At the same time, the presence of depression/anxiety induces coronary heart disease and also affects the prognosis of patients with coronary heart disease. Therefore, cardiologists should pay attention to their psychological status while treating patients with coronary heart disease. Early intervention for patients with comorbid coronary heart disease and affective disorder is beneficial to patients with short-term and long-term prognosis. Therefore, it is necessary to improve the prognosis of patients with coronary heart disease by studying psychological disorders.

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