

Anxiety Level Based on the Severity of Coronary Slow Flow in Patients Referred to Taleghani Hospital in 2019-2020

Hedie Jabbari^{1,*}, Mohamad Esmail Gheydari¹, Seyedshahab Banihashem², Mohamad Amin Pourhoseingholi³



1. Department of Cardiology, School of Medicine, Ayatollah Taleghani Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

2. Department of Psychiatry, School of Medicine, Ayatollah Taleghani Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

3. Gastroenterology and Liver Diseases Research Center, Research Institute for Gastroenterology and Liver Diseases Shahid Beheshti University of Medical Sciences, Tehran, Iran.

ABSTRACT

Background: The present study aimed to evaluate the probable relationship between the anxiety level and the severity of Coronary artery involvement in patients with Slow Flow patterns in Taleghani Hospital, Tehran, Iran, in 2019-2020. **Materials & Methods:** 150 patients with a definitive diagnosis of coronary artery disease (CAD) with the Slow Flow pattern in the coronary care unit (CCU) were studied. Demographic data of patients was recorded by an interview at the beginning of the study through questionnaires designed by researchers. The patient's anxiety was measured in the first referral session by applying 21-item Beck Anxiety Inventory (BAI) after angiography. The data obtained from the questionnaires and angiographies were analyzed so as to investigate the possible relationship between vascular involvement and anxiety severity using SPSS version 26. **Results:** 2% had a severe Slow Flow pattern, and the rest had low to moderate involvement. The most common issue among the subjects was smoking. The mean BAI score was generally 11.02 ± 12.76 , which means mild or low anxiety in individuals. In addition, the mean score of BAI in both sexes showed mild or low anxiety. To be more specific, those with a higher intensity than the Slow Flow pattern in the studies showed moderate anxiety. There was a significant and direct relationship between anxiety score and drug abuse, hypertension, clogged arteries, and angioplasty. **Conclusion:** The level of anxiety in patients was generally low and mild, but in patients with severe involvement, anxiety was moderate. No significant relationship was found between the level of anxiety and the vascular involvement severity.

Keywords: Anxiety, Coronary Artery Disease, Slow Flow

Receive Date: 02 January 2024
 Revise Date: 05 February 2024
 Accept Date: 18 February 2024
 Published Date: 26 February 2024
 Editor: AA. Moodi Ghalibaf (Conflict of Interests: None)
 Reviewers: M. Jafari (Conflict of Interests: None), A. Madadi Mahani (Conflict of Interests: None), M. Ataee Karizmeh (Conflict of Interests: None).

*Correspondence to: Hedie Jabbari, Board Certified Cardiologist, Department of Cardiology, School of Medicine, Ayatollah Taleghani Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

Email: Hedie_jabbari021@yahoo.com
 ORCID ID: 0000-0001-5732-2594

Cite as : Hedie Jabbari, Mohamad Esmail Gheydari, Seyedshahab Banihashem, Mohamad Amin Pourhoseingholi. Anxiety Level Based on the Severity of Coronary Slow Flow in Patients Referred to Taleghani Hospital in 2019-2020. Canon Journal of Medicine. 2023 December; 4(4):XX-XX.



INTRODUCTION

Coronary Slow Flow Phenomenon (CSFP) is detected in angiography with delayed distal opacification without significant coronary stenosis. In addition to creating a curiosity for angiography, CSFP is characterized by dangerous arrhythmias, sudden cardiac death, acute coronary syndromes (ACS), and clinical symptoms of some diseases (1, 2). The CSFP clinically manifests mainly in youths, smokers, and ACS patients (3). More than 80% of CSFP patients suffer from recurrent chest pain (often at bedtime) due to the complex clinical course of CSFP, which approximately 20% of cases requiring hospitalization in a coronary care unit (CCU) (4).

Most importantly, CSFP is linked to deadly arrhythmias and sudden cardiac death (SCD); the probable cause in this type of patient

is increased QTc dispersion (5-7). Endothelial dysfunction could be the most common pathophysiological mechanism of metabolic syndrome and CSFP (8, 9). Several studies have also reported the relationship between negative emotions, such as depression and anxiety, and CAD (10-12). Furthermore, depression has been identified as a solid cardiovascular disease predictor in stable CAD patients (13). Among patients with CAD, anxiety symptoms are also related to an increased risk of death or myocardial infarction (14). Despite the well-known relationship between CAD and anxiety and depression, limited studies have been conducted to identify the relationship between the Slow Flow coronary pattern and anxiety in patients. Accordingly, the present study evaluated the probable relationship between anxiety level and the severity of coronary ar-

Table 1. Demographic variables of the studied subjects

Demographic characteristics	n (% n)	Minimum	Maximum	Mean± SD
Female	50 (33.3 %)	38	80	55.82±11.27
Age (years)				
Male	100 (66.7 %)	18	83	54.02±12.57
Total	150	18	83	54.62±12.14
Height (cm)	150	145	187	170.44±8.28
Weight (Kg)	150	52	117	74.84±12.12

tery involvement in patients with Slow Flow patterns.

MATERIALS AND METHODS

The current study was descriptive-analytical and cross-sectional research. This study included one hundred fifty patients admitted to the CCU of Ayatollah Taleghani Hospital, Tehran, Iran, from 2019 to 2020 with a definitive diagnosis of CAD with the Slow Flow pattern. To observe ethical considerations, the researchers obtained informed consent from participants. Demographic information of patients, including age, sex, risk factors for cardiovascular diseases such as hypertension, hyperlipidemia, smoking, diabetes, and previous history of myocardial infarction, were recorded by an interview at the beginning of the study through questionnaires designed by researchers.

The Beck Anxiety Inventory (BAI) measured patients' anxiety in the first referral session after angiography. This questionnaire includes 21 items with a score of 0 to 3 (from the least to the most severe) for each question. According to this questionnaire, the higher the score obtained, the higher the level of anxiety. The cutoff classification of this questionnaire was 0-7: minimal anxiety; 8-15: mild anxiety; 16-25: moderate anxiety; 26-63: severe anxiety.

The present study was carried out under the Helsinki Declaration Principles. Lastly, the data obtained from the questionnaires and angiographies were analyzed to investigate the possible relationship between vascular involvement and anxiety severity using SPSS version 26. Descriptive statistical methods were used to describe the data, such as calculating percentage, mean, standard deviation, and Pearson correlation to determine the relationship. The significance level of 0.05 was considered. The Ethics Committee of Shahid Beheshti University of Medical Sciences approved this study with the code of IR.SBMU.MSP.REC.1398.509.

RESULTS

One hundred fifty people, with a mean age of 54.62 ± 12.14 years, were included in this study, men with a frequency of 66.7% and women with a frequency of 33.3%. The subjects' mean height and weight were correspondingly 170.44 ± 8.28 cm and 74.84 ± 12.12 kg (Table 1).

The prevalence of hyperlipidemia was 24%, higher than other dis-

Table 2. Prevalence of physical and psychological diseases

Systemic and Psychiatry diseases	n	% n
Diabetes	15	10 %
Hypertension	35	23.3 %
Hyperlipidemia	36	24 %
Brain stroke	4	2.7 %
Renal failure	7	4.7 %
Family history of heart disease	42	28 %
Paternal intensive slow flow		
Minimal & Mild & Moderate	147	98 %
Severe	3	2 %
Myocardial infarction	2	1.3 %
Clogged arteries	5	3.3 %
Heart diseases		
Angioplasty	4	2.7 %
Valvular heart disease	5	3.3 %
Arrhythmia	5	3.3 %
Heart failure	1	0.7%
History of Psychiatry disorders	12	8 %
Family history of Psychiatry disorders	5	3.4 %
severity of anxiety based on Beck questionnaire		
Minimal	84	56 %
Mild	17	11.3 %
Moderate	32	21.3 %
Severe	17	11.3 %
Smoking	55	36.7 %
Habitual behavior		
Alcohol	13	8.7 %
Drugs abuse	13	8.7 %

Table 3. Evaluation of the mean score of BAI based on various criteria

Variable	Minimum	Maximum	Mean± SD
Sex			
Female	0	43	11.28±13.01
Male	0	55	10.89±12.70
Total	0	55	11.02±12.76

Table 4. Evaluation of the mean score of the BAI based on the intensity of the Slow Flow pattern

Severity	Minimum	Maximum	Mean± SD	P-value*
Minimal & Mild & Moderate	0	55	10.87±12.59	0.146
severe	0	43	18.33±22.18	

*. Based on T-test

eases, followed by hypertension, diabetes, renal failure, and stroke, respectively. Among the subjects, 2% had a severe Slow Flow pattern, and the rest had a low or moderate involvement. Moreover, these people's most common heart diseases were clogged arteries, valvular diseases, and arrhythmias, with 3.3%, followed by



Table 5. Investigation of Pearson correlation between the studied variables

Pierson	Sex	Age	Smoking	Alcohol	Drug abuse*	Diabetes	Hypertension**	Hyperlipidemia	Brain stroke	Renal failure	Myocardial infarction	Clogged arteries*	Angioplasty*	Valvular heart disease	Arrhythmia	Heart failure	Slow flow
Mean. Beck Score.	0.014	0.048	0.088	0.080	0.162	-0.011	0.263	0.095	0.120	0.139	0.105	0.186	0.185	0.026	0.010	0.101	0.082

*: Significance level is less than 0.05. / **: Significance level is less than 0.01.

angioplasty, myocardial infarction, and heart failure, respectively. 8% had a history of psychiatric disorders, and 3.4% had a positive family history of psychiatry. Smoking, with 36.7%, was also the most common behavior among all subjects (Table 2).

The mean of BAI score was generally 11.02 ± 12.76 , which means mild or low anxiety in individuals. The mean score of BAI in both sexes indicates mild or low anxiety in women, it was higher than men and equal to 11.28 ± 13.01 (Table 3).

The mean score of the BAI was higher for individuals with severe involvement group than the low and moderate groups, and it was equal to 18.33 ± 22.18 . Based on the independent t-test, no significant difference was observed between the two groups. Similarly, the score of BAI in the group with severe involvement indicates the presence of moderate anxiety (Table 4).

A significant and direct relationship was observed between BAI score and drug abuse, hypertension, clogged arteries, and angioplasty (Table 5).

DISCUSSION

The purpose of the current study was to evaluate the level of anxiety based on the severity of vascular involvement in patients suffer from CAD with the Slow Flow pattern in Taleghani Hospital, Tehran, Iran, in 2019-2020. No significant relationship was observed between the intensity of the Slow Flow pattern and the level of anxiety. However, a relationship was dramatically observed between BAI score and drug abuse, hypertension, clogged arteries, and angioplasty.

In the study of Montone et al., women's mean age and percentage are lower than this study (15). Moreover, in the present study, the complications related to this pattern and the mortality rate were not considered, and in Montone et al.'s study, the level of anxiety was not reported.

Elamragy et al. published an article in 2019 entitled "Anxiety and depression relationship with the coronary Slow Flow" (16). The

method of their study is different from the present study, but in terms of factors influencing the occurrence of the Slow Flow pattern, there is a concordance between two studies, such as male gender, smoking, and high prevalence of hyperlipidemia. However, in terms of the significant relationship between the degree of anxiety and the severity of vascular involvement, the Elamragy study does not enrich our findings.

Juskiene et al., have demonstrated the higher level of anxiety in patients with heart disease, which is consistent with the results of the present study, although there is a difference in terms of study method (17). Ghanbari Afra et al.'s findings regarding patients with CAD are not comparable to those of this study (18). Durmaz et al. published a study in 2014 entitled "Coronary Slow Flow is Associated with Depression and Anxiety" (19). Their results were inconsistent with the current study on the significant relationship between slow coronary flow and anxiety. In contrast to the findings of this study, Ebadi et al. examined hospital anxiety and depression among patients with CAD in 2011(20), which are not comparable to the present study results.

LIMITATIONS

One limitation is regarding the insufficient number of patients. Failure to evaluate patients' anxiety levels with other questionnaires was other limitation. The present study is a cross-sectional study that cannot show a definite causal relationship between anxiety level and the severity of coronary artery involvement in patients with Slow Flow patterns. There was no follow up to evaluate long-term outcomes in current study.

CONCLUSION

Findings of this study showed that most patients diagnosed with the Slow Flow pattern are in their sixth decade of life, most of whom are men. The level of anxiety in patients were generally low and mild, but in patients with severe involvement, anxiety



was moderate. However, it should be noted that no significant relationship was found between the level of anxiety and the vascular involvement severity. Large-scale clinical studies are required to evaluate the relationship between anxiety level and severity of coronary slow flow much better.

ETHICAL CONSIDERATIONS

All stages of the study were conducted in accordance to provisions of the Helsinki declaration. In addition, all patients participating in the study signed an informed consent form.

CONFLICT OF INTERESTS

There are no conflicts of interest in terms of the present manuscript.

ABBREVIATIONS

CAD; coronary artery disease, CCU; coronary care unit, BAI; Beck Anxiety Inventory, CSFP; Coronary Slow Flow Phenomenon, ACS; acute coronary syndromes.

REFERENCES

1. Threapleton DE, Greenwood DC, Evans CE, Cleghorn CL, Nykjaer C, Woodhead C, et al. Dietary fibre intake and risk of cardiovascular disease: systematic review and meta-analysis. *Bmj*. 2013;347.
2. Gonsalves AH, Thabtah F, Mohammad RMA, Singh G, editors. Prediction of coronary heart disease using machine learning: An experimental analysis. Proceedings of the 2019 3rd International Conference on Deep Learning Technologies; 2019.
3. Hanson MA, Fareed MT, Argenio SL, Agunwamba AO, Hanson TR. Coronary artery disease. *Primary care*. 2013;40(1):1-16.
4. Mendis S, Puska P, Norrving B, Organization WH. Global atlas on cardiovascular disease prevention and control: World Health Organization; 2011.
5. Murray CJ, Barber RM, Foreman KJ, Ozgoren AA, Abd-Allah F, Abera SF, et al. Global, regional, and national disability-adjusted life years (DALYs) for 306 diseases and injuries and healthy life expectancy (HALE) for 188 countries, 1990–2013: quantifying the epidemiological transition. *The Lancet*. 2015;386(10009):2145-91.
6. Wong ND. Epidemiological studies of CHD and the evolution of preventive cardiology. *Nature Reviews Cardiology*. 2014;11(5):276-89.
7. National Heart L, Institute B. What are the signs and symptoms of coronary heart disease. Bethesda: National Heart, Lung, and Blood Institute. 2016.
8. Vos T, Allen C, Arora M, Barber RM, Bhutta ZA, Brown A, et al. Global, regional, and national incidence, prevalence, and years lived with disability for 310 diseases and injuries, 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015. *The lancet*. 2016;388(10053):1545-602.
9. Wang H, Naghavi M, Allen C, Barber RM, Bhutta ZA, Carter A, et al. Global, regional, and national life expectancy, all-cause mortality, and cause-specific mortality for 249 causes of death, 1980–2015: a systematic analysis for the Global Burden of Disease Study 2015. *The lancet*. 2016;388(10053):1459-544.
10. Moran AE, Forouzanfar MH, Roth GA, Mensah GA, Ezzati M, Murray CJ, et al. Temporal trends in ischemic heart disease mortality in 21 world regions, 1980 to 2010: the Global Burden of Disease 2010 study. *Circulation*. 2014;129(14):1483-92.
11. Moran AE, Forouzanfar MH, Roth GA, Mensah GA, Ezzati M, Flaxman A, et al. The global burden of ischemic heart disease in 1990 and 2010: the Global Burden of Disease 2010 study. *Circulation*. 2014;129(14):1493-501.
12. Control CfD, Prevention. Prevalence of coronary heart disease--United States, 2006-2010. *MMWR Morbidity and mortality weekly report*. 2011;60(40):1377-81.
13. Vancini RL, Nikolaidis PT, de Lira CAB, Vancini-Campanharo CR, Viana RB, Andrade MdS, et al. Prevention of sudden death related to sport: the

science of basic life support—from theory to practice. *Journal of clinical medicine*. 2019;8(4):556.

14. Kontos MC, Diercks DB, Kirk JD, editors. Emergency department and office-based evaluation of patients with chest pain. *Mayo Clinic Proceedings*; 2010: Elsevier.
15. Montone RA, Galiuto L, Meucci MC, Del Buono MG, Vergni F, Camilli M, et al. Coronary slow flow is associated with a worse clinical outcome in patients with Takotsubo syndrome. *Heart*. 2020;106(12):923-30.
16. Elamragy AA, Abdelhalim AA, Arafa ME, Baghdady YM. Anxiety and depression relationship with coronary slow flow. *PLoS One*. 2019;14(9):e0221918-e.
17. Juskiene A, Podlipskyte A, Bunevicius A, Varoneckas G. Type D Personality and Sleep Quality in Coronary Artery Disease Patients With and Without Obstructive Sleep Apnea: Mediating Effects of Anxiety and Depression. *International Journal of Behavioral Medicine*. 2018;25(2):171-82.
18. Ghanbari Afra L, Zaheri A. Relationship of Anxiety, Stress, and Depression with Spiritual Health in Patients with Acute Coronary Artery Disease. *Journal of Education and Community Health*. 2017;4(2):28-34.
19. Durmaz T, Keles T, Erdogan KE, Ayhan H, Bilen E, Bayram NA, et al. Coronary Slow Flow is Associated with Depression and Anxiety. *Acta Cardiol Sin*. 2014;30(3):197-203.
20. Ebadi A, Moradian S T, Feyzi F, Asiabi M. Comparison of the hospital anxiety and depression among patients with coronary artery disease based on proposed treatment. *jccnursing*. 2011; 4 (2) :97-102

Author Contribution: All authors have contributed in this study.

Funding statement: None.

Acknowledgements: None.

© **Canon Journal of Medicine 2023**. This is an open-access article distributed under the terms of the Creative Commons Attribution-Noncommercial 4.0 International License (CC-BY), which permits unrestricted use, distribution, and reproduction in any medium, including commercial gain.

