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The study of relationship of state anxiety with selective, shifting and sustained attention in volunteer patients of coronary artery surgery

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ABSTRACT

One of the most common approaches of coronary artery in cardiovascular patients is subjected to coronary artery bypass graft or CABG. The recent studies show that patients suffer from moderate cognitive disorder mostly focused on the field of concentration and memory after the surgery. One of the these risk factors effects on the reduction of the cognition is the state anxiety before surgery which has been reviewed as the relationship between state anxiety with selective, shifting and sustain attention due to the importance of cognition elements. The state anxiety using Spielberg's state anxiety questionnaire and selective, shafting and sustain attention were measured by neuropsychological Stroop, SAT and CPT, respectively. Patients were categorized into two 30 people groups who were with coronary artery stenosis. One of these groups was under surgery but the second waiting for operation. The first group was firstly before surgery and month later after surgery and the second group were given a turn and then they were got in the bed after a month later and tested there. The relationship between anxiety and attention using Pearson correlation coefficient was evaluated which there was no found any significant difference in compare to both groups in test results. There was observed a significant relationship only in the second step of stroop test in patients who waiting for in the surgery list. Also, in the second step of the test, the operated group of CPT also had a significant relationship between spent time and anxiety. It seems that one of the most effective factors on the study results is the period of testing before surgery suggesting that these should be achieved in a short time in next researches.

Key words: Selective, shifting and sustained attention, cognition, state anxiety, coronary artery bypass graft

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INTRODUCTION

After surgery and anesthesia, many old patients are susceptible to the weakness of cognitive function particularly at memory. This condition is called post operative cognitive disorder (POCD) which longing for weeks or month [10]. The coronary artery surgery as a common method of cardiac medium has been effective in ventricular dysfunction.

During two decades, the degree of mortality after CABG has been efficiently reduced due to the advanced surgery techniques. Although it is reported that a considerable proportion of patients treated with CABG has shown a moderate anxiety and cognitive shortage after surgery for weeks or month and year [7]. Some variables of pre-surgery can increase the risk of POCD; For example, factors like intensity and duration of cardiac disease, diabetics and neural disorders history have been considered as the powerful indicators and predictors of cognition dysfunctions after surgery; of course, old- aged can be represented as a risk factor in this regard. Although there is a considerable reduction of mortality related to this surgery, but cognition disorder [short and long times] after surgery has an essential importance [3]. In terms of patient and his or her family perspective, the most objections concentration changes [3]. The performance of CABG candidates' cognition behavior before surgery is determined by comparison to control groups in relation to normalization of cardio vascular disease in some cognitive fields as predicted what expected. In addition, patients who recognized as having cognitive malfunction may get under surgery after 6 days or 6 month later. Because some early evaluation of patients is achieved in hospital before surgery, this weak cognitive function may be subjected to state factors such as anxiety and unsuitable testing conditions [3]. Anxiety and depression are those behavioral disorders which exist in patients 65 years old lower candidate for cardiac surgery, and long hospitalized causing the progression of these moods [11]. Patients whose state anxiety is high before their surgery, they will react keenly to relief medications in compare to patients with low anxiety [17]. Many observations have shown that the dysfunction of neuropsychological issues after cardiac surgery including cognitive dysfunction and temper state have effective impact on the prognosis, treatment efficacy and anxiety symptoms as well as their life quality [19]. The risk of coronary artery factors is in the healthy population. Although the role of anxiety in predicting adverse cardiac events is not clear in the recognition of people with coronary artery disease, but the study of the recent studies indicate that there are few observations exits to ignore the related role generally. Among CAD patients the anxiety exits increasing the degree of mortality and morbidity [8]. Phobia and anxiety before surgery are the topics of many researches. Based on the earlier studies, the positive cardiac experiences such as feeling conservation and safety, positive predictions are those essential factors influencing on patients welfare [17]. The negative excitements also impact on CABG patients [17]. Although, studies reviewed the effect of anxiety before surgery, but they never were confirmed them as well. [3]. Mentioning the fact may seem that if statistical analyses do not show considerable difference, but personal difference and results can be observed in each person's score which are very important [2]. In this study, the whole basis of cognition performances subjected to the brain as an information gateway has been evaluated as specific and three- dimension of shifting, selective and sustain foundations. [2]. Shifting attention is called for the ability of considerable resource change from one stimulus towards another one. The ability of conservation of attention resources on a specific stimuli and removing destructive stimulants is called selective attention; Again, the conservation of a specific stimuli in a long period (more than 10 minutes) is called sustain attention [15]. Then, the relationship of attention with patient's state anxiety is evaluated as well.

MATERIALS AND METHODS

Measurement tools:

1. Stroop Test: The measurement of selective attention would be achieved using Stroop test in this study. The Stroop test is a basic test of frontal lobe performance. In the test a name of color [such as green] is written with another color [like red]. In the test, the one is asked to tell the color in stead of reading it. In the test, a subject spends much time to name a color word in compare to a geometrical shape [6]. In the present study, the computer- based test of Stroop was used; In other words, the subject will press the some color key on the keyboard instead of reading the word. The measured indices of the test including: False statement error (pressing the key against unsuitable stimulant), the mean reaction time of the subject against correct responds. The Stroop test is a laboratory model for measuring the lobe blood stream through pet during the achievement of the test is along with increasing posterior lobe activity [the middle lobe of pre- frontal] [15].

2. SAT test (shifting attention test):

This test is a scale for measuring shifting attention.

In this study, the computer- based model has been applied. The test is being achieved in two steps.

First steps: a circle- shaped figure is given to the person as the foundation showing two different figure 1 and figure 2 as square or triangle, to the person. He is asked to choose one of these two figures without paying attention to their color and the similar foundation figure pressing key 1 or 2 on the keyboard.

Second steps: the same circle- shaped figure with the same color is given to the person as foundation figure and then, the figure 1 is given as randomly circle, triangle or square but the color of the circle is the same and the figure 2 as circle, triangle or square randomly is given color fully. In this selection, the person is asked to choose without paying attention to the figure the only the same color of the foundation figure pressing key 1 and 2 on the keyboard. The measured indices of the test including: the number of correct responds and the mean response reaction time of subject against correct responds [2].

3. CPT test (continuous performance test):
This test has been used for measuring the continuous attention. A series of numbers are being determined in a specified period and two stimulants as the target as well as the sample would be pressed urgently the related key with the observation of numbers.

The variables of the test including omitting error [not pressing the target key against the stimuli], false statement error [pressing key against non- target stimuli] and time of correct responds reaction [the mean time of correct responds against stimuli based on thousands in seconds].

The picture making researches have been shown the performance of brain activity in frontal lobe during the completion of continuous performance test [1].

4. Spielberg state questionnaire:
A questionnaire with 20 questions including statements which people apply it for describing their own issues. Patients who can explain their best feelings determine the options with tick mark or "*****" mark. The first questionnaire from each questing including four choices: never, a little, moderate and very high which have been devoted from 1-4 score.

The scale of state- anxiety trait has been represented by Spielberg and et al [1970] by the name of STAI_X. In the revised form of STAI_X, IZ articles of 40 articles of the form, 30% of the form X has been amended recovering the psychological measurement traits of both state and anxiety trait scales. [18].

Following: From 20-31 moderate state anxiety, 32-42 moderate to low, 42-53 moderate to high, 54-64 little severe state- anxiety [14]. This questionnaire has a considerable validity and reliability. In studies carried out in Iran, the validity of anxiety trait is 91% and reliability has been reported 90% [14]. In this study, the questionnaire has been applied for measuring and comparing patient's state anxiety during the completion of tests due to the importance of state anxiety in test results.

5. MMSE (Mini mental status Examination) questionnaire: This questionnaire: This questionnaire has been introduced by Marshal Folstein et al in 1975 to the world which is one of the most common tests for the evaluation of patients assessing six articles as following: orientation, registration, attention and calculation, recalling, language and design. This questionnaire has a satisfactory validity and reliability in Iran and it can be distinct in 21 cut point with 90% sensitivity and 84% specificity of people with disorder from abnormal ones [4].

Completion methodology:
The statistical community is including the whole patients referring to Tehran heart center as candidate for coronary artery surgery in two 30 ones groups who were taken up as available method. The first group or control group was subjected to those patients who referred to hospital in a determined deadline and they were under 60 year-old with the lowest literacy of reading and writing. These patients were testified after hospitalizing in the related selection. First, psychological interview was achieved to determine their mental disorders and if they were not reported any disorder, the test of MMSE was completed on them testing their cognition health getting entered into test step. In this step, to evaluate state anxiety due to their hospitalizing and surgery, the questionnaire of Spielberg state anxiety was asked to be filled and then explanation were given to the patients in relation to neuropsychological tests, and it's completion method. The second step of testing of these patients was determined one month after surgery. Psychological interview and MMSE tests were achieved and after filling the form of Spielberg, the neuropsychological tests were done. The second group was related to those patients who referred to hospital for hospitalizing turn; these patients were selected from those one who were under 60 year-old with at least reading and writing. After filling the satisfaction form, the psychological and cognition interview like the first group was taken place to testify their health in this regard. These patients also filled the Spielberg questionnaire ant got ready for

neuropsychological tests; they were explained about the tests and their completions. The second step of testing was when patients were referred to hospital for surgery.

Data analysis:

In this part, due to the present topic of the study about the study of state anxiety with selective, shifting and sustain in patients volunteered for surgery, the inferential data [test of hypotheses] would be applied by the use of SPSS software. Along the inferential analyses and hypotheses test, the research has been used by Pearson correlation coefficient. In order to study the relationship between state anxiety score and selective, shifting attention of candidate patients of coronary artery surgery and non-surgery group, the first step of the test [60 people] and second step [30 ones] were separately evaluated due to having the whole correlation hypotheses of state-anxiety and selective and shifting attentions which the obtained results of the test are shown in the following tables.

Table 1. The results of Pearson correlation test between state anxiety score and selective and shifting attention at first test

		Firs step		Second step		Third step	
		Correct respond	time	Correct respond	time	Correct respond	time
State anxiety	Selective attention	0.084	0.110	0.043	0.165	0.091	0.046
	Shifting attention	0.107	0.062	-0.045	0.084	--	--

Table 2. The results of Pearson correlation test between state anxiety score and selective and shifting attention at second test

		Firs step		Second step		Third step	
		Correct respond	time	Correct respond	time	Correct respond	time
Selective attention	Surgery	-0.221	0.347	-0.094	0.251	-0.199	-0.089
	Non- Surgery	0.129	0.198	0.015	*0.424	0.034	0.164
Shifting attention	Surgery	-0.290	0.200	0.047	0.125	--	--
	Non- Surgery	0.261	0.006	-0.135	0.264	--	--

According to the above-mentioned table and the emphasis on the degree of correlation coefficients, and due to the obtained significance level higher than the 0.05, it can be stated that there are no any significant relationships between the score of state anxiety and selective, shifting attention in candidate patients of coronary artery surgery and non-surgery group in α=0.05 level but the obtained significant level in spent time is lower than 0.05 for the second step of stroop test representing that there is a significant relationship in the second step between patients without surgery and state anxiety score and spent time for stroop test in level α=0.05. In other words, any increase of patients anxiety spent time test will also increase for the second step of stroop test, and the anxiety is reduced the speed of responding time of patients. The correlation of state anxiety score and sustain attention in the first step (60 people) and second step (two 30 groups) were separately evaluated which the results are given in the following tables.

Table 3. The results of person correlation test between state anxiety score and sustain attention in first and second tests

		Commit error	Omitting error	time
State anxiety	First test N=60	-1.103	0.238	0.259
	Second test N=30	0239	-0.117	-0.057
	Second test of Non surgery N=30	0.127	0.001	-0.162

In steps 1 and 2, there is no any significant relationship between state anxiety and sustain attention in both patients groups [Surgery and non-surgery] at level α=0.05.

Only in step 2, surgery group and due to the obtained significant level in spent time for CPT test is governed lower than 0.05 representing than it the whole patients of coronary artery, there is a significant relationship between state anxiety and spent time for CPT test in α=0.05 level.

In other words, any increase in patient's anxiety of spent time for the test, CPT will also increase and the anxiety reduces the speed of patients' response.

RESULTS AND DISCUSSION

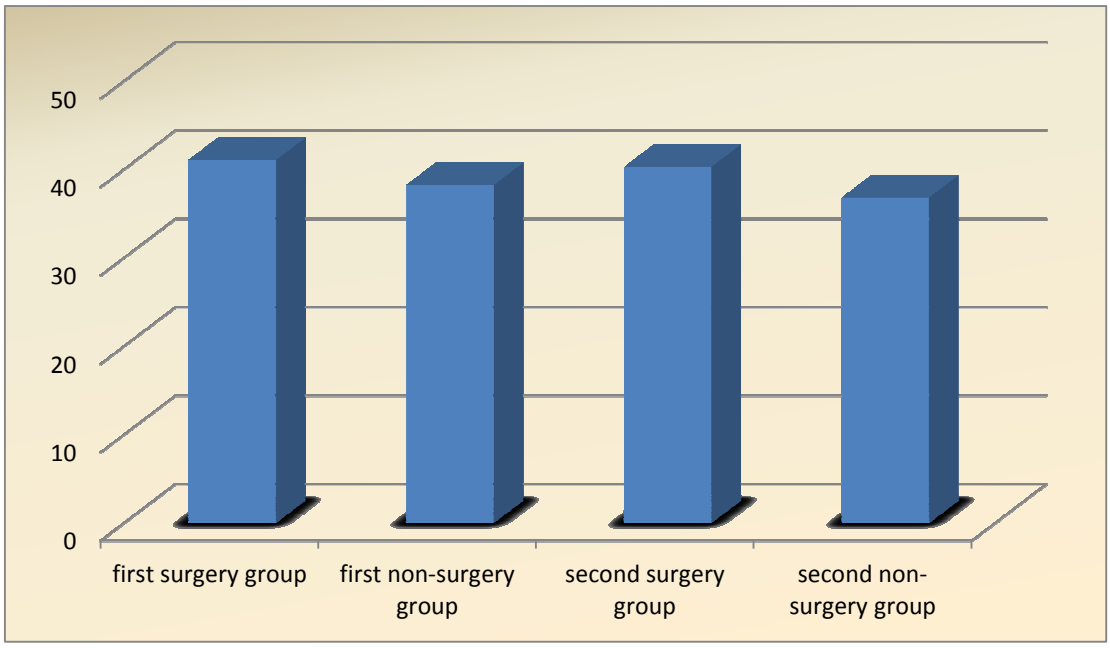
To study the difference of state anxiety of candidate patients in coronary surgery at the first step of the test and after one month follow-up process, in the second step of the test [Surgery and non-surgery] and the comparison of patients mean anxiety from ANOVA was used which the results have show in table 3.

Table 4. The results of single variance analysis test: The comparison of patient's means anxiety at surgery and non-surgery group in both test steps.

Shifting resource	Total squares	Df	Mean squares	F	Sig
Inter group variance	353.425	3	117.808		
Among group variance	14780.567	116	127.419	0.925	0.431
Total variance	15133.992	119	--		

As shown in the above-mentioned table, the significance level is obtained higher than 0.05; hence it is emphasized on the degree of F (0.925). It can be stated that there is no any significant difference between the mean anxiety of patients' candidate for coronary artery surgery at first step and follow-up one month and in the second step between both groups (surgery and non-surgery0. In other words, there is no found any relationship between patient's state anxiety and coronary artery surgery.

Figure 1. The mean state anxiety of both groups [surgery and non-surgery] at first and second tests



DISCUSSION AND CONCLUSION

Phobia and anxiety have been common during hospitalization [17]. In Shahmansouri's study [12], the anxiety of patient at low level, 19.7%, moderate 14% and sever 11.15% has been reported. It seems that phobia and anxiety are the stable excitements which do not change due to the external factors. It may be happened to those patients waiting for surgery in a high level of phobia and anxiety [17], but in our study this is rejected and no found any significant difference between both groups of experienced anxiety. Plotek [17] also found the same results in his study and observed that the statistical results do not support this kind of hypothesis but surgeries patients tend to have low level of phobia than control group. In terms of Tully [13], the combination of depression and anxiety effects on physiological mechanisms make distressed people psychologically susceptible to cardiac problems. Rosen bloom [8] considers his research results in relation to early studies have shown the anxiety is an independent risky factor for patient's death under CABG surgery. The observed relationship between STAI scores and the risk of death or MI

representing the fact that it must be paid attention to low levels of anxiety. Some early studies in fustian CAD patients found that anxiety is related to a worse prognosis, al tough CABG patients are independent than CAD patients having difference affected under anxiety [8]. It may be better compare the anxiety level of cardiac patients operated and one another group which do not need any surgery to determine the anxiety of coronary patients is due to the operation they will confront it as soon; therefore, in statistical analyses, no any difference would be appeared in compare to pre and post operations. The cognitive dysfunction, anxiety and depression after surgery are the most common neuropsychological disorder after cardiac surgery [19]. But the main aim of our study was to determine the hypothesis that weather any relationship between pre-surgery anxiety and patients cognition score exits or no. The findings of Plotek [17] were that patients present worse results in term of psychiatric evaluations in the second day of cardiac surgery and phobia along with anxiety is the most effective factors in this regard. The results of Krysta's study [9] were that the intensity change of anxiety and depression and other analyzed cognitive performances except learning were statistically considerable. Although the correlation of anxiety and depression symptoms was considerable with cognitive deficiencies in the field of the disorders, but these results indicate that the test of cognitive performances act independently than excitement mood of the present patients study results.

The results statistical analysis did not obtain considerable relationship in compare to both groups and state anxiety did not influence on the attention tests. In our previous study (2012) if the results were not statistically significant but we observed the reduction of attention scores after operation. As a result, it must be studied the effect of risky factors than anxiety in the recognition of patients. Probably, one of the reasons of the lack of state anxiety effectiveness is subjected to the completion of attention-based tasks which patients hospitalizing day but their operation's time are determined one week to ten days later which the anxiety of patients may be reduced due to the operation days. Therefore, it is recommended that in the next researches, the state anxiety should be measured and evaluated in the mentioned periodical interruption as well.

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