

COMPARISON BETWEEN ACUTE MYOCARDIAL INFARCTION VERSUS CARDIAC ARREST PATIENTS IN RELATION TO QUALITY OF THEIR LIFE AND DEPRESSION

Fahad M. Alanazi^{*1}, Majed B. Alshammari^{*2}, Turki S. Alduhaim^{*3}, Amirah Alanazi^{*4},
Hanan Al Shammary^{*5}, Fawaz Almutairi^{*6}

^{*1,2,3,4,5,6}King Abdulaziz Medical City For National Guard Health Affairs' Riyadh, KSA.

^{*6}King Saud Bin Abdulaziz University For Health Sciences, Kingdom Of Saudi Arabia.

^{*}Corresponding author. E-mail: almutairifa12@ngha.med.sa.

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ABSTRACT

Background: Although many diseases have an association with depression, cardiac problems tend to affect person's emotional status by depression and physical status by affecting the quality of life. This research is to assess this relation in order to find the association of STEMI patients and cardiac arrest patients in quality of life and depression.

Methods: The data have been conducted by questionnaire forms, the research is retrospective, done in a cross-sectional method and it is quantitative type of research. Inclusion criteria include Patients who presented to hospital with STEMI and patients who came with STEMI and had experienced cardiac arrest. Exclusion criteria include cardiac arrest secondary to non-cardiac etiology and patients early in psychiatric medication prior STEMI event. This study is conducted in Cardiac Catheterization laboratory at King Abdulaziz Cardiac Center (KACC). Sample size of 190 patients.

Results: The research results indicated that there are positive association between depression and patients who had STEMI, our sample size is 190 patients, 171 (90%) were male, whereas 19 (10%) were female. The mean age of 55, mean BMI of 17.69, and mean heart rate of 78 . One of the main point in our result, 87 (45.8%) patients were depressed, 90 (47.9%) were diabetic patients, 80 (45.5%) were hypertensive, (24.3%) have done CABG surgery, 30 (62.5%) have done PCI and 12 (6.5%) experienced cardiac arrest. Data were analyzed by using the statistical software; IBM SPSS Statistics 22.0. For continuous variables, data were reported as mean and standard deviation. Chi-square test were used to compare between depression subgroups. **Conclusion:** Overall, our findings indicated that there is significant evidence that STEMI patients are susceptible to other disorders like depression, which worsen the patient's condition. Furthermore, quality of life may decrease in post STEMI patients. Other factors may increase that depression. However, clinical practice can help in post STEMI and cardiac arrest conditions.

Keywords: Acute Myocardial Infarction; Post-Cardiac Arrest Patients; Quality Of Life; Depression.

I. INTRODUCTION

The heart is considered one of the most important organs in the body, many worldwide diseases are related to the heart. When coronary arteries of the heart do not get enough oxygen, the heart muscle will get affected and will eventually die (necrosis), however, the patient will experience acute myocardial infarction. Another life threatening condition is cardiac arrest, where the conduction system of the heart is affected and the heart stops pumping blood to the body systems. There was a clear hospital visitation in psychiatric clinics about patients who had acute myocardial infarction or cardiac arrest; they usually came with symptoms of depression. Not only that, but also some of them missed the old functioning life that now does not exist anymore. For example, the daily activity they used to do. Moreover, some patients had improved their health related quality of life a few weeks after procedure. Nevertheless, other patients had suffered from depression and their quality of life did not improve.

Acute myocardial infarction is irreversible death of heart muscle secondary to the insufficiency of oxygen supply. It is considered one of the most common heart diseases, Approximately 1.5 million cases of Myocardial infarction occur annually in the United States [1]. For example, heart attack is a life threatening condition when

blood supply eventually cut off, Depression among patients with acute myocardial infarction (AMI) is prevalent and associated with an adverse quality of life and prognosis [2]. Furthermore, Depression in patients with acute myocardial infarction is related with increased long-term morbidity and mortality [2]. Depression is reasonably common following acute Myocardial infarction and the management plans should include a consultation with psychiatric for individualized control of depression in post myocardial infarction patients [3]. Never the less, the findings indicate that the health related quality of life is affected after acute myocardial infarction in the long term.

Cardiac arrest is when the heart suddenly stops pumping blood round the body, usually due to a problem with electrical signals referred to the heart's conduction system. When the heart stops pumping blood, the brain is starved of oxygen, and that will cause unconsciousness and stop breathing for the patient [4]. The incidence of out-of-hospital cardiac arrest is 326,200 [5]. The average survival rate is 10.6% and survival with good neurologic function is 8.3%, Nearly one in three victims survives [5].

Most common mental disorders post cardiac arrest is depression [6]. Many out-hospital cardiac arrest survivors complain that they experience psychological distress and feel uncomfortable. A Cardiac arrest may lead to permanent cognitive impairments and the risk of dementia may be higher because of the injuries sustained during the collapse [7]. Regarding the findings of cardiac arrest patients, there was a tendency of lower health related quality of life and lower scores on the cognitive testing [7].

Depression is a commonplace and debilitating temper disorder. Rather than just sadness in response to existence's struggles and setbacks, despair changes how you observe, feel, and are characteristic in day-by-day activities [8]. It may intrude along with your potential to work, study, consume, sleep, and enjoy life. The emotions of helplessness, hopelessness, and worthlessness can be intense and unrelenting, with little remedy [8]. Depressive signs and symptoms have been an impartial predictor of headaches and extended length of stay after acute myocardial infarction [9]. Interventions to control depressive signs and symptoms early after acute myocardial infarction are necessary [9]. In case of depression related to cardiac arrest, long-term outcome in terms of activities, participation, and quality of life after cardiac arrest is reassuring [10]. Nevertheless, fatigue is common; problems with cognition and emotions occur; and return to work can be at risk [10].

Health related quality of life is an important measure patient's recovery after the illness [11] . Many studies have shown that the health related quality of life will be reduced in patients who experienced interventional procedure for acute myocardial infarction [12]. However, patients treated with thrombolytic medication improved their health-related quality of life post procedure [12]. The impact of acute myocardial infarction on health related quality of life is modest, physical capacity, work status, symptoms, functional status and general health perception decreased the most after acute myocardial infarction [12]. Nevertheless, the majority of these health related quality of life domains improved to normal with time [12]. Age plays a very important role in health-related patient post-acute myocardial infarction [12].

Survival rate of patient who survived cardiac arrest is low, however, health condition with cardiac arrest may include cardiac dysfunction, cognitive impairment, emotional issues and daily activities are harder to be done. One the other hand, some patients had improved their health related quality of life because they did the reasons that would help them to pass this problem [13]. After surviving an out-of-hospital cardiac arrest, many patients and partners encounter extensive impairments in their level of functioning and quality of life. Gender, age, PCI and therapeutic hypothermia are associated with differences in long-term functioning of patients[13].

Cardiac arrest is deferent than acute myocardial infarction, cardiac arrest occurs when the electrical impulses of the heart become fast and uncontrolled, and that will cause the heart suddenly to stop beating [14]. On the other hand, acute myocardial infarction happens when the blood supply to part of the heart muscle is blocked [14]. One important concept is that acute myocardial infarction may cause cardiac arrest if serious and not treated [15]. Both acute myocardial infarction and cardiac arrest patients are susceptible to develop depression after the procedure [16]. Moreover, patients may be afraid of the reoccurrence of the condition, some patients experience nightmares of what happened. All theses events will affects the mental status of the patients [17]. The health related quality of life in both cardiac arrest and acute myocardial infarction patients is susceptible to be affected [18]. For example, the patient may experience body fatigue, old tasks is now hard to be done, the adaptation to the new drugs , avoid eating unhealthy food and stop doing old bad habits [19].

Many studies indicate that there is a clear physically and mentally effects on patient who had experienced cardiac arrest or acute myocardial infarction, mentally by depression and physically by health related quality of life like fatigue [20]. On the other hand, other studies said that the affect of depression and health related quality of life on patients with cardiac arrest or actue myocardial infarction is minimum and near normal. therefore, in our research study, The aim of our study is to assess the differences between acute myocardial infarction versus cardiac arrest patients in relation to their quality of life and and level of depression.

II. METHODS AND MATERIALS

Our study is conducted in a retrospective way (chart review). This kind of design is very suitable and help us to represents our variables very clearly and also help in providing the feasible data presentation in our quantitative research. It is a cross-sectional type.

This study is conducted in the Cardiac Catheterization laboratory at King Abdul-Aziz Cardiac Center (KACC), King Abdul-Aziz Medical city in Riyadh (KAMC-R), National Guard Health Affairs which is a governmental organization of more than 1000 beds. KACC started operations in 1999 and moved to a dedicated center in 2002. Patients involved only if they attmitted to KAMC's Cath lab for cardiac Catheterization with an indication of acute myocardial infarction or cardiac arrest. All recorded patients in the system was randomly obtained in a way that every patient would have an equal chance to be selected in the study. So our sampling technique is propapility randomized sampling.

We have two groups of participant, one for acute myocardial infarction. The another one is for cardiac arrest. 190 patients willing to participate in this study, all the study subject selected pertinent to the following inclusion and exclusion criteria. Inclusion criteria include; patient above the age of 18, patient presented to hospital with STEMI, patient with cardiac arrest and with clear histology of STEMI, patient discharged from hospital with complete recovery. And exclusion criteria include; cardiac arrest secondary to uncardiac etiology, patient early in psychiatric medication prior to the event [STEMI , cardiac arrest]. The data collection guide would be provided after the approval of the (IRB), and the data was conducted in a manner of questionnaire.

Patient healthcare questioner (PHQ), the tools used in this study to measure qualty of life and level of depression as a dependent variable, (PHQ) was adopted from (Ann Gen Psychiatry,2017). (PHQ) Items scored on a five-point Likert scale (Never (0) to always (5)). The response of each participant was calculated to get their respons' interpretation.

All the data was obtained from KACC's medical record section. Some variable was collected by using Excel sheet and data collection sheet. Patients' confidential information was not exposed to anyone . Only anonymous MRN (medical Record Number) can be exposed. All data were coded in Exel sheet and then imported to SPSS (Version 22) for analysis.

Data were analyzed by using the statistical software; IBM SPSS Statistics 22.0 (SPSS, Inc., Chicago, IL). Demographic and descriptive data for categorical variables were expressed as count and percentage. For continuous variables, data were reported as mean and standard deviation. Chi-square test were used to compare between depression subgroups. The normality of the data were assessed by using a shapiro-wilk test. A 2-tailed p-value of ≤ 0.05 will be considered statistically significant.

III. RESULTS

The findings of our study resulted from the assessment of STEMI and cardiac arrest patients in quality of life and depression, our sample size is 190 patients. The mean age of 55, mean BMI of 17.69, and mean heart rate of 78 are considered normal (table 1).

171 (90%) were male, whereas 19 (10%) were female as seen in (table 2). One of the main point in our result, 87 (45.8%) patients were depressed, 90 (47.9%) were diabetic patients, 80 (45.5%) were hypertensive , 64 (36.6%) were smokers, 9 (24.3%) have done CABG surgery, 30 (62.5%) have done PCI and 12 (6.5%) experienced cardiac arrest as seen in (table 2).

Our result indicated that some variables resulted with significant association with depression, such as hypertensive patient with (P-value = 0.006) , patient prior CABG with (P-value = 0.023) and patients prior PCI with (P-value = 0.041) as shown in (table 3). Not only that, but also we have found other significant factors that might affect the patient's condition and increase the depression status. For example, the income with (P-value = 0.056), number of dependents with (P-value = 0.026) and BMI with (P-value = 0.056) as seen in (table 4). For

Educational level, we have found that illiterate people were more depressed than educated people. On the other hand, post graduate people were less depressed (table 5).

Table 1: Overall baseline characteristics of STEMI patients (Quantitative).

Characteristic	Mean	±SD
Age (years)	55	15
BMI	17.69	14.34
HR	78	16
Systolic BP	129	20
Diastolic BP	75	15
First Creatinine	91	30
Creatinine Clearance	96	37
First Trop I	8575	16603
First CKMB	54.4	94.5
First CK	787.3	1253.7
Door To Balloon Time	90	35
Estimated LOS Days	5	1

Table 2: Overall baseline characteristics of STEMI patients (Qualitative).

Characteristic		No.	%
	Depression	87	45.8%
Gender	Male	171	90.0%
	Diabetes	90	47.9%
	Hypertension	80	45.5%
	Hyperlipidemia	78	42.2%
	Smoker	64	36.6%
	Family History of CAD	3	1.8%
	CABG	9	24.3%
	PCI	30	62.5%
	Renal Failure	3	2.7%
	CV Disease	3	1.7%
	Peripheral Vascular Disease	1	1.0%
	COPD	3	2.9%
	Cardiac Arrest	12	6.5%

* P-value is significant at the 0.05 level (2-tailed).

Table 3: Sub-groups analysis of depression status among STEMI patients .

Characteristic		Depression Status				p-value
		Yes (n=87)		No (n=103)		
		N	N %	N	N %	
Gender	male	75	43.9%	96	56.1%	.145
Diabetes		43	47.8%	47	52.2%	.770
Hypertension		47	58.8%	33	41.3%	.006*

Hyperlipidemia	36	46.2%	42	53.8%	.529
Smoker	32	50.0%	32	50.0%	.534
Family History of CAD	1	33.3%	2	66.7%	.582
Prior CABG	8	88.9%	1	11.1%	.023*
Prior PCI	14	46.7%	16	53.3%	.041*
Renal Failure	3	100.0%	0	0.0%	.118
CV Disease	2	66.7%	1	33.3%	.586
Peripheral Vascular Disease	1	100.0%	0	0.0%	.467
COPD	3	100.0%	0	0.0%	.081
Cardiac Arrest	5	41.7%	7	58.3%	.500

* P-value is significant at the 0.05 level (2-tailed).

Table 4: Sub-groups analysis of depression status among STEMI patients (Quantitative).

Characteristic	Depression status (N=190)				p-value
	Yes (n=87)		No (n=103)		
	Mean	±SD	Mean	±SD	
Age	55	13	55	11	.506
Income	3842	5115	5654	7690	.056*
Number of dependents	5	4	6	4	.026*
BMI	12.30	13.67	25.23	11.86	.056*
HR	76	17	80	15	.138
Systolic BP	128	22	129	19	.619
Diastolic BP	76	16	73	13	.246
First Creatinine	94	35	89	25	.236
Creatinine Clearance	93	33	98	40	.392
First Trop I	7218	14905	9708	17923	.389
First CKMB	49.5	89.8	58.3	98.5	.612
First CK	590.4	968.0	946.7	1432.2	.117
Door To Balloon Time	93	35	87	35	.200
Estimated LOS Days	5	1	4	1	.648
Last Estimated EF	44	8	43	10	.405

* P-value is significant at the 0.05 level (2-tailed)

Table 5: Demographic characteristics depression status groups among STEMI patients

Characteristics	Depression status			
	Yes		No	
	N	N %	N	N %
illiterate	30	52.6%	27	47.4%
primary education	15	36.6%	26	63.4%
intermediate education	11	55.0%	9	45.0%
high-school education	16	48.5%	17	51.5%

	postgraduate education	12	34.3%	23	65.7%
	single	1	25.0%	3	75.0%
Social status	married	73	43.7%	94	56.3%
	widowed	7	63.6%	4	36.4%
	divorced	6	75.0%	2	25.0%
	refugee camp	0	0.0%	1	100.0%
	village	12	46.2%	14	53.8%
Housing type	city	75	46.3%	87	53.7%
	owned a house	42	38.5%	67	61.5%
	agency house	5	55.6%	4	44.4%
Housing status	rented house	40	55.6%	32	44.4%
	employed	30	44.8%	37	55.2%
Work status	unemployed	56	46.3%	65	53.7%

IV. DISCUSSION

The major finding of our study is that the patients with STEMI condition, may face a new lifestyle and face some difficulties after the Procedure. Unfortunately, that may lead to depression and decrease the patient's quality of life. Our results indicate a positive association between patients with STEMI and depression. Not only that but also their quality of life may be reduced. Moreover, Depression and Quality of Life post STEMI play an essential role to the patient's health, congruently [21]. Some other factors may increase the level of depression to the patients post STEMI. Comparing our study to other studies, the results are mainly the same. However, we have shown the other factors that may deteriorate the depression condition of the patients post STEMI, in the same line [22,23]. For instance, Income, Educational Level, and multiple diseases that may worsen the situation. Furthermore, In clinical view, we suggest that it is for the patients benefit to answer questionnaire form in the follow up appointments, and assess if the patient have depression or not. Thus, may refer to psychiatric clinic when have symptoms of depression. Limitations of the study include recall bias, sample size and language barrier. Strength of the study include using high quality data collection and measuring depression among STEMI patients in national studies.

V. CONCLUSION

Overall, our findings indicated that there are significant evidences that STEMI patients are susceptible to have other disorders like depression, which worsen the condition of the patient. Furthermore, quality of life may decreases in post STEMI patients. Other factors may increase that depression. However, clinical practice can help in post STEMI and cardiac arrest conditions. Eventually, Bad life style like smoking, Consuming junk food and sedation can lead to major problems like hypertension, diabetes, STEMI, depression, and that may lead to cardiac arrest. We suggest a bigger sample size and advanced clinical solutions in further studies.

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