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Effect of Implementing Nursing Guidelines on Controlling Hyperglycemia for Patients With Acute Myocardial Infarction

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Abstract

Background: Hyperglycemia doubles the risk of recurrent myocardial infarction, heart failure, cardiogenic shock, and death. Control of hyperglycemia is important to prevent complications. **Aim:** Evaluate the effect of implementing nursing guidelines on controlling hyperglycemia in patients with acute myocardial infarction. **Design:** Aquasi experimental research design. **Setting:** Coronary care unit at El-Minia University Hospital. **Subjects and method:** Sixty basically sick grown-up patients who satisfied the consideration criteria and gave intense myocardial infarction with hyperglycemia. Patients were partitioned into two equivalent groups 30 patients for each, (study and control groups). **Study Tools:** Three tools were utilized to collect data in the present study (Patient assessment tool, Cardiac assessment tool, and Hyperglycemia assessment sheet). **Results:** We discovered significantly less inconveniences was identified with Myocardial infarction and diabetes in the study group than in the control group, and additionally measurably critical change in the examination assemble regarding to all items of knowledge ($P=0.0001^*$). **Conclusion:** Implementation of nursing guidelines results an improvement on outcomes of hyperglycemic patients in the setting of intense myocardial infarction. **Recommendation:** Glucose levels should be monitored closely in patients admitted to a coronary care unit with acute myocardial infarction as long as hypoglycemia is avoided.

Keywords: *Acute Myocardial Infarction, Complications, Control Hyperglycemia, Guidelines, Insulin & Self-Management Education.*

Introduction

Myocardial infarction (MI) is the most widely recognized reason for mortality in diabetics, and numerous researches have shown that diabetic patients are twice as likely to die from MI compared with non-diabetic patients (Donahoe, et al., 2007).

Diabetes mellitus is a group of metabolic illnesses described by hyperglycemia coming about because of deformities in the insulin discharge, insulin activity, or both. Individuals with diabetes are more likely to be hospitalized and to have longer durations of hospital stay than those without diabetes. The chronic hyperglycemia of diabetes is associated with long-term damage, dysfunction, and failure of various organs, particularly the heart, and blood vessels (American Diabetes Association, 2008).

Diabetes mellitus is a complex metabolic disorder characterized by hyperglycemia occurring as a result of defects of insulin outflow, insulin movement coming working out as expected in insulin resistance, or a combination of both. About 85–90% of adults with diabetes have type 2, which often develops after middle age, increases with age, and the patients are often physically inactive (American Diabetes Association, 2013 - 2014).

The acute stress of an acute myocardial infarction (AMI) may unmask impaired glucose tolerance or

frank diabetes. Prompt recognition of diabetes in patients with an AMI would inform optimal risk stratification; secondary prevention therapies (e.g., dietary and lifestyle modifications, use of ACE inhibitors); coronary revascularization decisions; and initiation of glucose-lowering therapies to prevent micro vascular complications (Farkouh, et al., 2012).

Responsibility of nurses mandates that before undertaking the insulin injection they should be understanding and deciphering an insulin medicine sheet, Drawing up the right measurements of insulin into an insulin syringe or effectively utilizing a pen device, Knowledge of infusion destinations, Rotate the infusion site with each dosage (Rotating the locales averts tissue rot), Examination of infusion destinations for any irritations because of regulating a subcutaneous infusion and utilization of a blood glucose meter to screen blood glucose and translation of the outcome. Medical caretakers should perceive and react to hyper- or hypoglycemia. Self-organization is a fundamental piece of a patient's instruction and ought to be done under the supervision of prepared staff before the release (American Diabetes Association 2016).

In our study diabetic patients have schedule of healthy diet to control the level of blood glucose to

prevent complications. So we determine amount of protein, carbohydrates, fat and fibers in food given to diabetic patients. The patients were taking three basic meals a day plus three snacks (**The Patient Education Institute, 2011**).

Significance of the study

Hyperglycemia has a significant negative impact on the morbidity and mortality of patients presenting with an acute myocardial infarction (AMI). Evidence indicates that persistent hyperglycemia after initial hospital admission continues to exert negative effects on AMI patients.

Hyperglycemia in the setting of acute myocardial infarction remains an area where aggressive therapy could lead to a significant improvement in the outcomes.

The initial observation clarified that elevated glucose level occurs commonly in patients with acute myocardial infarction (AMI) was made many decades ago. Numerous studies have since then definitively established that hyperglycemia is highly prevalent what's more, related with expanded danger of death and in-healing facility difficulties in patients with AMI, particularly in those without established diabetes.

Nurses should fulfill a leading role in diabetes treatment and care education as existing clinical and observational clinical trials have shown nurses to be capable of providing an effective quality care at lower costs. Drawing upon the expertise of nurses in providing care for diseases such as diabetes in different clinical.

Aim of the study

Evaluate the impact of implementing nursing guidelines on controlling hyperglycemia for patients with acute myocardial infarction

Subjects & Method

Research design: Aquasi- experimental research design was used to conduct this research.

Setting of the Research: The study was completed in the Coronary care unit at El-Minia University Hospital.

Sample: The research included 60 basically sick grown-up patients who were admitted to the coronary care unit. They were determined as acute myocardial infarction to have diabetes or late hyperglycemia after confirmation. They were haphazardly partitioned into two equivalent study and control groups; 30 patients in each.

Inclusion criteria: All adult patients admitted to the coronary care unit with the finding of acute myocardial infarction with hyperglycemia of both sexes, who aged between 20-60 years.

Exclusion criteria: Patients with chronic diseases as: Lung disease, Kidney disease, Hepatic disease, History of malignancies and chemotherapy were excluded.

Study Tools

Three tools were used to gather information in our research. They are created by the researcher in the wake of going through a broad and pertinent survey of writing.

Tool 1: patient assessment tools

This tool was developed by the researcher in light of checking on of the pertinent writing, and used to evaluate the examined patients with respect to the socio-demographic information and restorative related information.

Tool 1 includes two parts

Part one: Socio-demographic and clinical data assessment sheet this includes patient's demographic data such as (patient's age, sex and marital status) and clinical data such as diagnosis, past medical diseases, risk factors, onset of complaint and duration of stay in hospital (**Updated Gilovich, et al., 2013**).

Part two: this part consists of three categories as following:

A- Assessment of hemodynamic parameters: (**Adler et al., 2014**). It includes temperature, pulse and Blood pressure. Those were assessed manually once daily for five days by the researcher.

B- Respiratory assessment: (**Higginson & Jones, 2009**) It includes respiratory rate, rhythm, and breath sounds as (Wheeze, Crepitation and Crackles), Pattern of respiration as (Tachypnea, Dyspnea, Orthopnea and Bradypnea), evidence of chest infection, and oxygen therapy. Oxygen saturation was assessed once daily for five days by the researcher.

C- Assessment of fluid balance (**Bouchard & Mehta 2010**) It includes calculation of total intake and output per 24 hours and then the total balance.

Tool 2: Cardiac assessment tool (Oriolo & Albarran, 2010).

This tool was created by the analyst in light of inspecting of the important writing and used to assess cardiac state after acute myocardial infarction through:

Part one: Monitoring of ECG rhythm sheet (Regular, Irregular), ECG comment (Normal, Abnormal) and types of arrhythmia.

Part two: Assessment of chest pain sheet (Oriolo, et al 2010): It includes onset of pain, severity, duration, character of pain (Stabbing, Burning and Compressing), radiation (left arm, right arm, shoulder and back), and frequency, Associating signs and symptoms (Nausea, vomiting, Sweating and shortening of breath), precipitating factors (breathing, walking and stress), Relieving factors (rest, spontaneously and drugs as sublingual nitrate).

Tool 3: hyperglycemia assessment sheet (Michael & Elizabeth 2012):

This tool was created by the researcher in view of exploring of the applicable writing, it includes four parts:

Part one: Blood sugar analysis and Laboratory investigation sheet: It includes analysis of blood glucose level, Cardiac enzymes, renal function test, serum potassium(K+), Prothrombine time, concentration and International Normalized Ratio (INR), complete blood picture, liver function test and serum sodium (Na).

Part two: Medication administration sheet (Megan and David 2016): It includes diabetes medications (insulin or oral medications) with follow up of doses, routes and frequency of medications in addition to cardiac medications and their side effects since admission and for five days.

Part three: Nutritional assessment sheet (Updated British Dietetics Association (2016): It covers assessment of the amount and type of diet for patients with diabetes and myocardial infarction related to their anthropometrics measurement (weight, height, body mass index and mid arm circumference).

Part four: Assessment of complication sheet (Ajmera, et al (2013): It includes complications related to MI such as (arrhythmia, cardiogenic shock and Congestive Heart Failure), and Complications related to diabetes such as (hyperglycemia, hypoglycemia, local allergic reaction and insulin resistance) to limit the length of stay in the coronary care unit (CCU) and improve patient outcomes.

Methods:

This study was completed through three stages:-

1-Preparatory stage

An official permission from the faculty of nursing to apply the research was conveyed to the healing center experts in El-Minia university hospital, and the morals panel, and endorsement to direct this research was acquired .

Written approval was acquired from the leader of the coronary care unit .

The tools utilized as a part of this research were produced by the specialist in view of audit of the related literary works .

The validity & reliability were assessed by a board of basic care nursing and medicinal specialists .

The content validity was tested by jury of (5) specialists in the field of the research (medicine and nursing) notwithstanding dietitian part from group wellbeing division, at Minia university .

A pilot study was completed before beginning of information gathering to test the possibility and materialness of the examination instruments on 10% of the example. The investigation of the pilot ponder characterized the adjustments required in the

apparatus utilized, and the essential change was finished before data accumulation. The considered subjects were excluded from the actual study.

Ethical consideration

1. Research proposal was approved from Ethical Committee in the Faculty of Nursing.
2. There is no risk for study subject during application of the research.
3. The study followed common ethical principles in clinical research.
4. Written consent was obtained from patients or guidance that is willing to participate in the study, after explaining the nature and purpose the study.
5. Confidentiality and anonymity were assured.
6. Study subject have the right to refuse to participate and or withdraw from the study without any rational any time.
7. Study subject privacy was considered during collection of data.

Data collection: Data were collected through more than a half year beginning from the earliest starting point of May 2014 and the finished at October 2014. The information's were gathered from the first day of admission and for five days subsequently.

2-Implementation stage

The study sample fulfilling the research criteria was assigned into two groups (study group and control group).

The researcher assessed the acute myocardial infarction patient according to the designed assessment sheet and routine hospital care, on the first day of admission as base line data, until the fifth day of the study by using study tools.

The researcher assessed patient's socio-demographic data and hemodynamic status manually on admission and for five days, in addition to assessment of Cardiological status by using assessment of ECG, chest pain and arrhythmia on admission and daily until discharge.

The researcher assessed patient's laboratory finding on admission and then according to the hospital routine including blood glucose level, renal function, liver function, Complete Blood picture, Troponin, INR and serum potassium and serum sodium.

Random blood sugar was tested immediately at admission to assess hyperglycemia, then follow up of blood glucose level was done every six hours, for 48 hours, and then it shifted to fasting and postprandial (twice per day) to determine anti-diabetic medications for patients with diabetes.

The researcher observed the cardiac drugs, particularly thrombolytic medications, to protect patients from complications.

The researcher assessed patient's nutrition status to control and prevent complications of diabetes in acute myocardial infarction.

The study group patients got the nursing rules for care of acute myocardial infarction with diabetes (American Diabetes Association, 2016).

The patient got the created nursing rules to enhance acute myocardial infarction and to prevent patient complications which include the following intervention:

- Schedule of healthy diet to control level of blood glucose to prevent complications (The Patient Education Institute, 2011).
- The calorie calculation according to anthropometric measurement (weight, height, mid arm circumference and body mass index) to each patient separately to determine amount of protein, carbohydrates, fat and fibers in food given to diabetic patients for five days.
- The patients were taking three basic meals a day plus three snacks by Collaboration between researcher and relatives of patients for five days.
- Continuous follow-up of the blood glucose level for each patient to assess the effectiveness of Schedule of healthy diet for five days.
- Teach the patients how to give insulin to themselves, injection sites and how to do analysis of blood glucose by the personal device.

- Teach the patients signs and symptoms of hyperglycemia or hypoglycemia to save his/her life.
- Instruct the patient about the importance of maintaining his/her prescribed medications for diabetes and heart disease, to preserve his life and prevent serious complications.

3 - Evaluation stage

The control and study groups of patients were evaluated daily for five days using the assessment sheet to determine the impact of nursing guidelines applied to the study group by assessing diet, blood glucose level, insulin injection and complications, to improve patient results.

Statistical Analysis

Information section and information investigation were finished utilizing SPSS version 19 (Statistical Package for Social Sciences). Information were introduced as number and rate (for non-parametric), or mean and standard deviation (for parametric). Chi-square test was utilized to relate between subjective factors. Autonomous examples t-test was utilized to relate between two quantitative variables. Paired samples t-test was done to compare quantitative variables between first and fifth days in each group. P-value <0.05 is considered statistically significant.

Results

Table (1): Socio-demographic data in both groups.

Variables	Control (n= 30)		Study (n= 30)		P-value
	No.	%	No.	%	
Age:					
60 years	14	46.7	21	70.0	0.067
> 60 years	16	53.3	9	30.0	
Mean \pm SD	57.77 \pm 8.92		54.67 \pm 6.39		0.127
Sex:					
Male	22	73.3	23	76.7	0.766
Female	8	26.7	7	23.3	
Marital status:					
Married	26	86.7	25	83.3	0.718
Widowed	4	13.3	5	16.7	

Table (2): Clinical data in the both groups.

Variable	Control (n= 30)		Study (n= 30)		P-value
	No.	%	No.	%	
Types of MI:					
Anterior MI	19	63.3	21	70.0	0.584
Inferior MI	9	30.0	7	23.3	0.559
Extensive MI	14	46.7	7	23.3	0.058*
Past medical disease:					
Unstable angina	5	16.7	8	26.7	0.895
Acute coronary syndrome	6	20.0	7	23.3	0.754
Cardiomyopathy	2	6.7	0	0.0	0.472
None	17	56.7	15	50.0	0.605

Variable	Control (n= 30)		Study (n= 30)		P-value
	No.	%	No.	%	
Risk factors:					
Hypertension	10	33.3	12	40.0	0.592
Smoking	15	50.0	8	26.7	0.063
Obesity	4	13.3	3	10.0	0.688
Atherosclerosis	3	10.0	0	0.0	0.236
Onset of diabetes:					
At admission in ICU	4	13.3	4	13.3	--
Less than 1 year	0	0.0	5	16.7	0.062
Many years ago \geq 5 years	26	86.7	21	70.0	0.117

Table (3): Assessment of chest pain in the both groups.

Variables	1 st day				P	3 rd day				P-value	5 th day				P-value			
	Control		Study			Control (n= 30)		Study (n=30)			Control (n= 30)		Study (n=30)					
	Mean \pm SD	Mean \pm SD	Mean \pm SD	Mean \pm SD		Mean \pm SD	Mean \pm SD	Mean \pm SD	Mean \pm SD									
Duration of chest pain/ minute	24.50 \pm 15.28		12.50 \pm 16.92		0.006*	1.77 \pm 3.73		2.13 \pm 3.81		0.708	0.47 \pm 1.17		0.10 \pm 0.55		0.125			
Frequency of chest pain/ day	4.53 \pm 2.26		4.31 \pm 4.44		0.088	2.00 \pm 0.93		2.00 \pm 1.33		0.705	1.40 \pm 0.89		1.00 \pm 0.00		0.655			
Character of chest pain: 1. Stabbing 2. Burning 3. Compressig	n= 30		n= 30		P-value	n= 8		n= 10		P-Value	n= 5		n= 1		P-Value			
	No.	%	No.	%		No.	%	No.	%		No.	%	No.	%				
	13	43.3	7	23.3		0.119	2	25.0	3		30.0	0.814	--	--		--	--	--
	11	36.7	11	36.7		0.920	3	37.5	4		40.0	0.914	--	--		--	--	--
	13	43.3	13	43.3	0.908	5	62.5	4	40.0	0.637	5	100	1	100	--			
Associating factors:																		
1. Nausea 2. Vomiting 3. Sweating 4. Dyspnea	10	33.3	7	24.1	0.436	2	25.0	3	30.0	0.814	2	40.0	0	0.0%	0.439			
	12	40.0	13	44.8	0.708	5	62.5	3	30.0	0.367	2	40.0	0	0.0%	0.439			
	21	70.0	20	69.0	0.931	5	62.5	6	60.0	0.914	1	20.0	0	0.0%	0.624			
	8	26.7	5	17.2	0.383	1	12.5	1	10.0	0.867	0	0.0%	0	0.0%	--			
Precipitating factors:																		
1. Walking 2. Stress 3. None	18	60.0	17	58.6	0.914	2	25.0	0	0.0%	0.356	2	40.0	0	0.0%	0.439			
	5	16.7	4	13.8	0.759	1	12.5	0	0.0%	0.444	0	0.0%	0	0.0%	--			
	8	26.7	10	34.5	0.514	5	62.5	10	100	0.069	3	60.0	1	100	0.439			
Relieving factors:																		
1. Drugs (SLN)* 2. Rest 3. Spontaneously	12	40.0	6	20.7	0.107	4	50.0	0	0.0%	0.085	2	40.0	0	0.0%	0.439			
	0	0.0%	0	0.0%	--	3	37.5	2	20.0	0.608	2	40.0	0	0.0%	0.439			
	0	0.0%	0	0.0%	--	1	12.5	8	80.0	0.015*	3	60.0	1	100.	0.439			

*SLN: sublingual nitrate.

Table (4): Complications related to myocardial infarction.

Presence of complications	Control (n= 30)				Study (n= 30)				P-value						
	No.		%		No.		%								
Yes	17		56.7%		1		3.3%		0.000*						
Types Of Complications	1 st day				3 rd day				5 th day				P-value		
	Control (n= 30)		Study (n=30)		P-value	Control (n= 30)		Study (n=30)		P-value	Control (n= 30)			Study (n=30)	
	No.	%	No.	%		No.	%	No.	%		No.	%		No.	%
1. Arrhythmia	3	10	1	3.3	0.389	3	10.0	--	--	0.645	--	--	--	--	
2. Congestive heart failure	10	33.3	--	--	0.908	7	23.3	--	--	0.356	--	--	--	--	
3. Cardiogenic shock	5	16.7	--	--	0.645	1	3.3%	--	--	0.313	--	--	--	--	
4. Reinfarction	2	6.7	--	--	0.803	1	3.3%	--	--	0.313	--	--	--	--	

Table (5): Mean \pm SD distribution of blood sugar for both group during 5 days

Random blood sugar	Control (n= 30)						Study (n= 30)						P-value ¹
	Mean \pm SD						Mean \pm SD						
	Morning		Evening		Night		Morning		Evening		Night		
1 st and 2 nd day	214.40 \pm 57.9		214.40 \pm 57.9		214.40 \pm 57.9		293.40 \pm 97.49		293.40 \pm 97.49		293.40 \pm 97.49		0.001*
3 rd day	211.07 \pm 47.6		211.07 \pm 47.6		--		186.23 \pm 77.96		186.23 \pm 77.96		--		0.019*
4 th day	180.67 \pm 37.24		180.67 \pm 37.24		--		132.83 \pm 36.14		132.83 \pm 36.14		--		0.000*
5 th day	142.83 \pm 31.5		142.83 \pm 31.5		--		137.17 \pm 27.22		137.17 \pm 27.22		--		0.459
P-value ²	0.000*		000*		--		0.000*		000*		--		

1: Comparison between Control and Study groups. 2: Comparison between First and Fifth days in each group.

Table (6): Percentage distribution of drugs (insulin) for both groups

Routes of medications:	Control (n= 30)						Study (n= 30)						P-value
	Morning		Evening		Night		Morning		Evening		Night		
1. Subcutaneous insulin	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
1 st day	30	100.0	30	100.0	30	100.0	30	100.0	30	100.0	30	100.0	--
2 nd day	30	100.0	30	100.0	30	100.0	30	100.0	30	100.0	30	100.0	0.313
3 rd day	30	100.0	30	100.0	30	100.0	29	96.7	0	0.0	29	96.7	0.313
4 th day	25	83.3	0	0.0	25	83.3	25	83.3	0	0.0	25	83.3	--
5 th day	18	60.0	0	0.0	18	60.0	15	50.0	0	0.0	15	50.0	0.604
2. Oral anti diabetic drugs													
1 st and 2 nd day	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	--
3 rd day	0	0.0	0	0.0	0	0.0	1	3.3	0	0.0	0	0.0	0.313
4 th day	4	13.3	1	3.3	0	0.0	0	0.0	5	16.7	0	0.0	0.718
5 th day	0	0.0	12	40.0	0	0.0	15	50.0	0	0.0	0	0.0	0.604
Frequency of medications:	Mean \pm SD						Mean \pm SD						P-value
1 st and 2 nd day / 6 hrs.	4.00 \pm 0.00						4.00 \pm 0.00						--
3 rd day / 12 hr.	2.63 \pm 1.25						2.83 \pm 1.29						0.543
4 th and 5 th day /12 hr. or once / day	1.80 \pm 0.81						1.57 \pm 0.68						0.230

Table (7): Percentage distribution of Patient's knowledge refers care of diabetes for study group

Knowledge items	Pre (n= 30)		Post (n= 30)		P-value
	No.	%	No.	%	
Diet:					
Unsatisfactory	27	90.0	9	30.0	0.0001*
Satisfactory	3	10.0	21	70.0	
Insulin injection:					
Unsatisfactory	25	83.3	0	0.0	0.0001*
Satisfactory	5	16.7	30	100.0	
Blood analysis:					
Unsatisfactory	30	100.0	19	63.3	0.0001*
Satisfactory	0	0.0	11	36.7	
Foot care:					
Unsatisfactory	20	66.7	6	20.0	0.0001*
Satisfactory	10	33.3	24	80.0	
Activity:					
Unsatisfactory	26	86.7	9	30.0	0.0001*
Satisfactory	4	13.3	21	70.0	

Table (1):- demonstrated Socio-demographic data in both groups as regarding to age, sex and marital status.

As regard age it was founded no significance difference between study and control group by Mean \pm SD (54.67 \pm 6.39 versus 57.77 \pm 8.92) respectively. As regard sex it was founded that, (76.7% versus 73.3%) of sample in study and control group. also, (83.3% versus 86.7%) in study and control group respectively married, while (16.7% versus 13.3%) in study and control group respectively were widowed.

Table (2): Showed clinical data between study and control group according to: Types of MI, it was founded that, (70.0% vs. 63.3%) in study and control group respectively had Anterior MI. While (23.3% vs. 30.0%) in study and control group respectively had Inferior MI. Also there significance difference (P=0.058) between study and control group had Extensive MI.

Regarding past medical disease, it was founded that, (26.7% vs. 16.7%) in study and control group respectively had unstable angina. While (23.3% vs. 20.0%) in study and control group respectively had acute coronary syndrome. Also there (0.0% vs. 6.7%) in study and control group respectively had Cardiomyopathy. Also there (50.0% vs. 56.7%) in study and control group respectively had not any past medical disease.

Concerning the risk factors, it was founded that, (40.0% vs. 33.3%) in study and control group respectively had hypertension, Also it was founded a significance difference (P=0.063) between study and

control group had smoking. While (10.0% vs. 13.3%) in study and control group respectively had obese.

Regarding the onset of diabetes, it was founded that, (13.3%) in both study and control group had hyperglycemia at admission. While it was founded that, a significance difference (P=0.062) was found between study and control group had diabetes Less than 1 year. Also there (70.0% vs. 86.7%) in study and control group respectively had Many years ago \geq 5 years.

Table (3): Showed an assessment of chest pain between study and control group on 1st day as regard the duration of chest pain, it was founded, highly a significance difference among study and control gathering (P=0.006) *

As respect Frequency of chest pain on first day it was established that no significant difference among study and control group (P=0.088). Additionally on 1st day, it was established no significant difference between the two groups in all other parameters as Character of chest pain, Associating factors, Precipitating factors or Relieving factors.

On 3rd day it was founded that, there was a significance difference among study and control group in suddenly alleviating factors (P=0.015*) while it was established no significant difference between the two groups in all other parameters as duration of chest pain, frequency of chest pain, character of chest pain or associating factors.

On 5th day all parameters as duration, frequency and character of chest pain and associating, precipitating or relieving factors were not significantly difference between the two groups.

Table (4): Demonstrated complications related to myocardial infarction among study and control group, it was established that, exceptionally importance contrast ($P=0.000^*$) less in the study group than in control group. It was founded that there was no a significant difference in types of complications in two groups.

Table (5): Showed Mean \pm SD distribution of blood sugar for both group during 5 days it was founded that, highly significance difference ($P=0.001^*$) on 1st and 2nd day and significance difference ($P=0.019^*$) on 3rd day and highly significance difference ($P=0.000^*$) on 5th day in the study group (as regarded P-value¹)

P-value² showed Comparison between First and Fifth days in each group there was highly significance difference ($P=0.000^*$)

Table (6): Showed Percentage distribution of drugs (insulin) for both groups there was no significant difference between the two groups.

Table (7): Showed Percentage distribution of patient's knowledge refers care of diabetes ($P=0.000^*$)

Discussion

Diabetic patients have a significantly worse prognosis after myocardial infarction than those without diabetes, mainly because of more prominent left ventricular dysfunction and expanded re-infarction rates (Jansson, et al., 2011). This applies to both patients who are newly diagnosed on the coronary care unit and those already diagnosed and recent evidence study suggests that a more intensive approach to achieving metabolic control in patients submitting hyperglycemia may be beneficial .

No significant difference at studied patients aged between 20 to 60 years, similar to the study of Anand, et al., (2008).

Men may have a higher risk than women for MI, because the female sex hormones may provide protection from atherosclerosis (Anand, et al., 2008) and higher prevalence of lipid abnormalities and smoking in men. Puska, et al., (2011) mentioned that worldwide, data show that men are more probable than ladies to have an acute myocardial infarction (AMI).

Many studies revealed that an excess of three fourths of the patients with MI are men and the greater part of the investigation test's age run between 50-65 years of age (Abdelhameed, et al., (2013). In accordance with these results, reported that (75%) were males.

This examination are similar to the study of Angerud, et al., (2013) in an examination of MI patients which uncovered that around two third of the contemplated subjects were males, Holle, et al.,

(2010) in like manner asserted that more settled patients have a high prevalence of MI.

With respect to marital state, the present study uncovered that most of the patients were married. These results were in line with many studies who revealed that their patients with MI were married.

The present study clarify that most of the patients had anterior MI as compared to inferior MI. These outcomes are in concurrence with the outcome of Aurigemma, et al., (2009) who revealed that most of the contemplated subjects had ST-elevation MI (STEMI).

the present study revealed that, less than half of the sample in both groups study and control were experienced hypertension, This comes in contrast with Bucholz, et al., (2012) reported in his study which was done on MI patients around two- thirds of the sample had hypertension, Moreover, Hawboldt, et al., (2010) found that more than half of their study subjects of them had hypertension. Nair (2009) reported that the stress of constantly elevated blood pressure can increase the rate of atherosclerosis development.

About half of our investigation subjects were smokers. This is conversely with the investigation done by Gulanick & Mayers (2011) who announced that around three fourths of the examination subjects were smokers.

The present study revealed that, about one third of the study and control group were obese. In accordance with these results, Bucholz, et al., (2012) in his study titled "Body mass index and mortality in acute myocardial infarction patients" reported that one third of the studied subjects were obese. Kivimäki et al., (2012) reported that obesity appears to be the cause of about 20% of coronary artery disease.

Many studies reported that more than three fourths of myocardial infarctions result from an acute thrombus that obstructs an atherosclerotic coronary artery

The present research revealed that, more than one third of both groups had sudden onset of hyperglycemia with AMI. Shore et al., (2014) reported in their study that, more a third of patients presenting with AMI were classified as having newly diagnosed diabetes.

Regarding assessment of chest pain, the present study found a significantly shorter duration of chest pain in the study group than in control group in the first day and unconstrained help of chest pain was fundamentally more in the examination assemble in the 3rd day. Muhammad, et al., (2013) found that 90% of patients with acute MI had chest pain persisting for >20 minutes.

As regard the complications of myocardial infarction with diabetes, the present study demonstrated that presence of complications related to myocardial

infarction and diabetes was essentially less in the examination assemble than in charge gathering. These outcomes are in concurrence with information from the Diabetes Control and Complications Trial (DCCT) and the United Kingdom Prospective Diabetes Study, which demonstrated a continuous relationship between control of hyperglycemia and diabetes complications (Cavalot & Pagliarino 2011).

Regarding Random blood sugar the present study demonstrated fundamentally decrease glucose level in the study group than in control group in the 3rd to 5th day of admission.

Insulin significantly reduced infarct size following regional ischemia and reperfusion in a dose-dependent manner and recent experimental data also supports the beneficial effects of insulin infusion among patients with AMI Wong et al (2011). Observational and small prospective studies, as well as experimental data, have demonstrated benefits in driving down a glucose target using insulin infusion (Loomba & Arora 2010).

As respects the Patient's Knowledge, the present study comes about depicted a measurably great significant difference amongst control and study group learning score after presentation to verbal instructional data, showing higher aggregate and subtotal mean post information scores among the contemplated gathering, positioned as acceptable to great levels. Be that as it may, the greater part of the contemplated subjects was having an unacceptable learning level before accepting the verbal instructional information. Thus, applying discharge configuration could effectively influence the lifestyle of patients with MI. The delayed consequences of this examination are in agreement with the study by (Hamid et al 2013).

Conclusion

Hyperglycemia in the setting of acute myocardial infarction remains an area where aggressive therapy could lead to a significant improvement in outcomes. Aggressive glycemetic control during hospitalization and appropriately stringent follow-up, diabetes screening, and risk factor modification may represent opportunities to improve care in this group of patients

Recommendations:

- Glucose levels should be monitored closely in patients admitted to an ICU with acute myocardial infarction as long as hypoglycemia is avoided.
- Glucose level should be a part of the initial laboratory evaluation in all patients with suspected or confirmed acute myocardial infarction.

- Treatment should be instituted as soon as feasible, without compromising the administration of life-saving and evidence-based treatments.
- Acute myocardial infarction patients with hyperglycemia but without prior history of diabetes should have further evaluation (preferably before hospital discharge).
- Before discharge, plans for optimal outpatient glucose control should be determined in those patients with set up diabetes and extreme myocardial dead tissue. The control of blood glucose levels in patients with intense myocardial dead tissue will lead to better outcomes regardless of diabetes status.

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