THE RELATIONSHIP BETWEEN RANDOM BLOOD SUGAR LEVEL AND ARRHYTHMIAS AFTER CABG

Thesis

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بسم الله الرحمن الرحيم

قالوا

سبحانك لا علم لنا
إلا ما علمتنا إنك أنت
العليم الحكيم

صدق الله العظيم

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Amr Ahmed Muhammad Abdelsalam

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LIST OF ABBREVIATIONS

$\chi 2$	**:**	Chi square test
*****	**:**	Significant ($p<0.05$)
******	**:**	Highly significant ($p<0.001$)
ACC	**:**	American College of Cardiology
ACEI	**:**	Angiotensin converting Enzyme inhibitor
ACLS	**:**	advanced cardiovascular life support
ACS	**:**	ACS acute coronary syndrome
AF	**:**	atrial fibrillation
AFL	**:**	and atrial flutter
AGE	**:**	Advanced Glycation End-products
AHA/ACC	**:**	American Heart Association\ American Colleague of Cardiology
ATS	**:**	atrial tachyarrhythmia's
AVNRT	**:**	AV nodal reentrant tachycardias
AVRT	**:**	AV reentrant tachycardias
Bas	**:**	Bradyarrhythmias
BB	**:**	Beta Blocker
BMI	**:**	Body Mass Index
BS	**:**	blood sugar concentration
Ca+2	**:**	Calcium
CABG	**:**	coronary artery bypass grafting
CAD	**:**	coronary artery disease
CaMKII	**:**	Ca2+/calmodulin-dependent protein kinase II
CBC	**:**	complete blood count
CCBs	**:**	Calcium channel blockers
CGTF	**:**	connective tissue growth factor
CKMB	**:**	Creatine kinase myocardial band
COPD	**:**	Chronic obstructive pulmonary disease
CPB	**:**	cardio pulmonary bypass
CV	**:**	cardiovascular
CVD	**:**	Cardio Vascular Disease
DBP	**:**	Diastolic Blood Pressure
DCL	**:**	disturbed conscious level
DM	**:**	Diabetes mellitus
ECG	**:**	electrocardiogram

EF	**:**	ejection fraction
GFR	**:**	GFR(Glomerular Filtration Rate.
HB	**:**	Hemoglobin
HR	**:**	Heart rate
HTN	**:**	Hypertension
ICD	**:**	implantable cardioverter-defibrillator
K	**:**	potassium
LAD	**:**	left anterior desendong
LVEDD	**:**	Left Ventricular End Diastolic Diameter
LVESD	**:**	Left Ventricular End Systolic Diameter
Na	**:**	sodium
NSVT	**:**	non sustained ventricular tachycardia
PCI	**:**	Percutaneous Coronary Intervention
PCI	**:**	percutaneous coronary intervention
PLT	**:**	Platelets
POAF	**:**	Postoperative atrial fibrillation
POAFL	**:**	Postoperative atrial flutter
POAS	**:**	Postoperative arrhythmias
POBAs	**:**	Postoperative bradyarrhythmias
POVTAs	**:**	Postoperative ventricular tachyarrhythmias
PPM	**:**	permanent pacemaker
PVCs	**:**	Premature ventricular complexes
RBBB	**:**	right bundle branch block
ROC	**:**	receiver operating characteristic curve
SBP	**:**	Systolic Blood Pressure
SPSS	**:**	Statistical Package for the Social Sciences
SVT	**:**	Supraventricular tachycardia
Vas	**:**	ventricular arrhythmias
Vf	**:**	Ventricular fibrillation
Vt	**:**	Ventricular tachyarrhythmias
WBCs	**:**	White blood cell count
WCT	**:**	Wide complex tachycardia's
WPW	**:**	Wolff-Parkinson-White

Abstract

Background: Arrhythmia is a major complication of CABG and it happens in 30 % of patients after CABG **.** Arrhythmias represent a significant source of morbidity and mortality. Mainly have a benign course ,it may prolong the icu stay and rarely may lead to mortaility . Postoperative arrhythmias (POAs) include atrial tachyarrhythmia's (ATs) and to a lesser extent ventricular arrhythmias (VAs) and Brady arrhythmias The outcome of arrhythmia depends on several factors like underlying cardiac function, patient's comorbidities, arrhythmia duration, and ventricular response rate. So, POAs could be tolerated in some patients and a source of morbidity and mortality in others**.**

Objective: We aim to analyze the relationship between serum random blood sugar concentration (BS) and arrhythmias after CABG.

Methodology: We conducted a case control study on 60 patients patients who underwent isolated elective on pump CABG divided in two groups group A arrhythmia group and group S non arrhythmia group patient clinical and procedure characters was notice and recorded Serum blood sugar.

Results: History of DM .insluin Intake , postoperative Mean AND Maximum BS and post operative drainage volume showed statistically significance (p-value < 0.05).

Conclusion: The predictors of postoperative Arrhythmias after CABG are hyperglycemia, history of Insluin intake and postoperative drainage volume. In particular, hyperglycemia and postoperative Arrhythmias after CABG were found to have a very strong association. Therefore, we believe that BS control should reduce the incidence of AF after CABG.

Keywords: Blood Sugar, CABG

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Introduction

Arrhythmias are common after cardiac surgery such as coronary artery bypass grafting (CABG) surgery and represent a significant source of morbidity and mortality. Although most of these arrhythmias are transient and have a benign course, it may prolong intensive care and hospital stay, and in rare instances, it may lead to mortality. Postoperative arrhythmias (POAs) include atrial tachyarrhythmia's (ATs) and to a lesser extent ventricular arrhythmias (VAs) and Brady arrhythmia ***[L. Herzog and C. Lynch, 1994).*** The clinical significance of each arrhythmia depends on several factors that include underlying cardiac function, patient's comorbidities, arrhythmia duration, and ventricular response rate. So, POAs could be tolerated in some patients and a source of morbidity and mortality in others, depending on the interaction between these factors ***[J.P.Mathew et al, 2004).***

Diabetes mellitus (DM) is recognized as a major cardiovascular (CV) risk factor and its close relationship with cardiovascular morbidity and mortality is well established ***[Garcia MJ. et al , 1974).*** Although coronary artery disease and related cardiac events are the most documented diabetic cardiovascular complications, cardiac electrical system is also an important target for diabetic damage. In Framingham heart study, DM is

established as an independent risk factor for atrial fibrillation (AF) after 38 years of follow-*up* ***[Benjamin EJ. et al , 1944).*** A recent meta-analyses published by Huxley ***[Huxley RR. et al ,2011)*** revealed that patients with DM had a 40% greater risk of developing AF compared to patients without.

Aim of the Work

We aim to analyze the relationship between serum random blood sugar concentration (BS) and arrhythmias after CABG.

Review of Literature

Chapter (1):

Coronary Artery Bypass Grafting

CABG was introduced in the 1960s with the aim of offering symptomatic relief, improved quality of life, and increased life expectancy to patients with coronary artery disease CAD **(van Domburg RT etal ,2009)** By the 1970s, CABG was found to increase survival rates in patients with multivessel disease and left main disease when compared with medical therapy **(Veterans Administration Coronary Artery Bypass Surgery Cooperative Study Group, 1984).**

Indications

Coronary artery bypass grafting (CABG) is performed for both symptomatic and prognostic reasons. Indications for CABG have been classified by the American College of Cardiology (ACC) and the American Heart Association (AHA) according to the level of evidence supporting the usefulness and efficacy of the procedure **(Hillis LD, et al. 2011) (Eagle KA, et al. 2004)** :

- Class I: Conditions for which there is evidence and/or general agreement that a given procedure or treatment is useful and effective

- Class II: Conditions for which there is conflicting evidence and/or a divergence of opinion about the usefulness or efficacy of a procedure or treatment
- Class IIa: Weight of evidence or opinion is in favor of usefulness or efficacy
- Class IIb: Usefulness or efficacy is less well established by evidence or opinion
- Class III: Conditions for which there is evidence and/or general agreement that the procedure/treatment is not useful or effective, and in some cases it may be harmful indications for CABG as detailed by the ACC and the AHA are listed in Table1