Comparison of Effects of Amiodarone versus Verapamil in Prevention of Atrial Fibrillation Post Coronary Artery Bypass Grafting

Thesis

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Arafat Mahmoud Mohammed

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List of Abbreviations

Abbr.	Full-term
AF	**:** Atrial fibrillation
AHA	**:** American Heart Association
ALI	**:** Acute lung injury
ARDS	**:** Acute respiratory distress syndrome
ARDS	**:** Acute respiratory distress syndrome
BSA	**:** Body surface area
C.V.S	**:** Cerebrovascular vascular stroke
CABG	**:** Coronary Artery Bypass Grafting
CAD	**:** Coronary artery disease
CFAE	**:** Complex fractionated atrial electrograms
CHF	**:** Chronic heart failure
COPD	**:** Chronic obstructive pulmonary disease
CPB	**:** Cardiopulmonary bypass
DAD	**:** Delayed after depolarizations
DBP	**:** diastolic blood pressure measures
DCC	**:** Direct current cardioversion
DEA	**:** Desethylamiodarone
DLCO	**:** Diffusing capacity of the lungs for carbon monoxide
DM	**:** Diabetes mellitus)
EAD	**:** Early after depolarizations
ECG	**:** Electrocardiogram

EGG : Electrocardiogram
ESC : European Society of cardiology
Family H : Family history
FDA : Food and Drug Administration
FT4 : Free thyroxine
HTN : Hypertension
INR : International normalized ratio
ITA : Internal thoracic artery
JET : Junctional ectopic tachycardias
JET : Junctional ectopic tachycardias
LA size : Left atrial size
LA : Left atrium
LAA : Left atrial appendage
LAD : Left main artery & Left atrial Diameter
LAVI : Left atrial volume index
LBBB : Left bundle branch block
LVEF : Left ventricle ejection fraction
Max : Maximum
Min : Minimum
N-AION : Non -arteritic anterior ischemic optic neuropathy
NSR : Normal sinus rhythm
OAC : Oral anticoagulation
PCI : Percutaneous coronary intervention
PCWP : Pulmonary capillary wedge pressure
PT : Prothrombin time

RCA : Right coronary artery

SBP : Systolic blood pressure measures

SD : Standard deviation

SPSS : Statistical Program for Social Science

SR : Sarcoplasmic reticulum

STEMI : St segment elevated myocardial infarction

TECAB : Totally endoscopic coronary artery bypass

TSH : Thyroid-stimulating hormone

VF : Ventricular Fibrillation

VKA : Vitamin K antagonists

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Abstract

Background: Atrial fibrillation (AF) is the most common sustained arrhythmia affecting humans. The initiation of AF may be caused by rapidly firing foci, in the pulmonary vein(s). Although the atrial rate is rapid,the ventricular response depends on atrioventricular (AV) node conduction and the autonomic tone conductivity of AV node. **Aim of the work:** to compare to compare effects of amiodarone and verapamil in prevention of atrial fibrillation post coronary artery bypass graft in patients with dilated left atrium. **Patients and Methods:** This study was carried out on 300 patients with dilated left atrium (more than 5mm in diameter) undergoing CABG surgery after approval of the medical ethical committee of Faculty of Medicine, Ain Shams University and obtaining informed written consent from all studied patients. **Results:** The rate effects of amiodarone a prevention of atrial fibrillation post coronary artery bypass is 24%. On the other hand, success rate effects of verapamil in prevention of atrial fibrillation post coronary artery bypass is 38%. The results of our study showed the superiority of amiodarone (p-value was significant =0.019) in prevention of atrial fibrillation post coronary artery than verapamil (p-value was significant =0.032). Also The results of our study showed the superiority of amiodarone group (A) (p-value was significant =0.022) in to decrease length of hospital stay significant fewer days than those in the Verapamil group (B) and placebo group (C). **Conclusion:** Intravenous infusion of amiodarone as well as Intravenous Verapamil can be successfully used in prevent of AF post CABG.

Key words: Amiodarone, Verapamil, Atrial Fibrillation, Coronary Artery Bypass Grafting

Introduction

Atrial fibrillation (AF) was recognized as a major cause of morbidity and mortality after CABG ***(Mirhosseini et al., 2013).*** The incidence of AF depends on several factors like clinical factors (duration of arrhythmia and co-morbid diseases), type of post-operative monitoring (intermittent or continuous) and changing profile of patients undergoing CABG ***(Erdil et al., 2013).***

Although the pathogenesis of AF after open heart surgery is incompletely understood, stimuli & triggers such as pre-existing structural changes of the atria related to hypertension, volume over load, age, atrial ischemia, electrolytes imbalances and pericardial lesions are thought to play a role in the pathogenesis of atrial fibrillation after coronary artery bypass grafting ***(Awer and Weber, 2005)***.

Therefore clinical data, ECG changes, echocardiography may be useful in pre-operative stratification of surgical patients for occurrence of post CABG AF. Maintenance of sinus rhythm could be effective in improving the quality of life and heart performance in patients with congestive heart failure (CHF), and also, could decrease the risk of thrombo-embolism and the side effects of long term anticoagulation therapy ***(Van Gelder et al., 2010).***

Patients with post-operative AF usually are older, have larger left atrium (LA) dimension, and electro-mechanical delay in atria. Also they have lower left ventricle ejection fraction (LVEF) and longer P-wave duration. They have smaller A-wave in Doppler echocardiography. It has been shown that the atrial electro-mechanical delay is the best independent factor for predicting the incidence of post-operative AF ***(Park et al., 2010).***

Aim of the Work

The aim of this study is to compare effects of amiodarone Versus verapamil in prevention of atrial fibrillation post coronary artery bypass graft in patients with dilated left atrium.

Atrial Fibrillation

Atrial fibrillation (AF) is the most common sustained cardiac arrhythmia. The arrhythmia has a prevalence of 1% and is age-dependent with ~10% of patients >80 years being affected in contrast to 0.1% of all individuals <55 years.In elderly patients the development of AF is mostly related to cardiac disorders, whereas younger patients may develop AF in the absence of underlying heart disease ("lone AF"). In addition, gender-specific pathophysiological mechanisms are suggested by retrospective data ***(Fuster et al., 2016).***

Between 1970 and 1990 the prevalence in men has more than doubled, while the prevalence of AF in women during this period remained unchanged. Furthermore, the annual incidence of AF is between 0.9% and 1.8% for men aged 65 to 74 and 1.8% and 4.3% for men aged 75 to 84. Corresponding incidences for women are lower and vary between 0.5% and 2.2% per 100 person-years, respectively. AF is associated with a 2-fold age-independent increase in mortality which is directly attributed to the arrhythmia as opposed to concomitant cardiovascular conditions ***(Benjamin et al., 1998).***

Symptoms associated with AF are primarily caused by rapid and irregular heart beat and include palpitations, dizziness, lightheadedness, anxiety, and reduced exercise capacity which result in severely impaired quality of life

However, one-third of patients exhibit no symptoms and are unaware of abnormal heart rhythm, preventing early detection and timely introduction of therapies. In some of patients the severity of symptoms decreases with time owing to a transition from paroxysmal to permanent AF In predisposed individuals the arrhythmia may be triggered by cardiac or thoracic surgery, infections, alcohol intake (binge drinking; "holiday heart disease"), nicotine or caffeine, hypoglycemia, electrolyte imbalances, and physical or emotional stress ***(Komatsu et al., 2010).***

Still it is not fully understood why paroxysmal, self-terminating AF turns into persistent AF, which is much more stable and harder to cardiovert. There is need to re-evaluate the causal relationship between AF and cardioembolic stroke. Data from recent trials suggest that the established idea of stasis in the fibrillating atrium leading to clot formation and eventually to an embolic stroke is questionable and that we need to know much more about local procoagulatory mechanisms triggered by morphological changes of the atrial myocardium that are caused by, or related to, AF ***(Gladstone et al., 2014).***