Prevalence of Tramadol users in STEMI

Thesis

Submitted for Partial Fulfillment of Master Degree
in Cardiovascular Diseases

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List of Abbreviations

Abb.	Full term

ACC..... *American College of Cardiology*
ACT..... *Activated clotting time*
ADP..... *Adenosine diphosphate*
AV ..... *Atrioventricular*
Bpm..... *Beats per minutes*
CABG..... *Coronary artery bypass grafting*
CI ..... *Confidence interval*
CK..... *Creatinine kinase*
CNS ..... *Central nervous system*
DAPT ..... *Double antiplatelet therapy*
DBP..... *Diastolic blood pressure.*
DEA ..... *Drug Enforcement Administration*
DES..... *Drug eluting stent*
DM ..... *Diabetes mellitus*
ED..... *Emergency department*
EF ..... *Ejection fraction*
ESC..... *European Society of Cardiology*
FDA..... *Food drug administration*
GP ..... *Glycoprotein*
HR..... *Heart rate*
HTN..... *Hypertension*
ICH ..... *Intracranial hemorrhage*
IHD ..... *Ischemic heart disease*
IRA..... *Infarct-related artery*
IV ..... *Intravenous*
LAD..... *Left anterior descending vessel*
LBBB ..... *Left bundle branch block*
LCX..... *Left circumflex vessel*
LM..... *Left main*

List of Abbreviations Cont…

Abb.	Full term
LVEDD	*Left ventricular end-diastolic diameter*
LVESD	*Left ventricular end-sys diameter*
NSTEMI	*Non-ST segment elevation myocardial infarction*
PCI	*Percutaneous coronary intervention*
RBBB	*Right bundle branch block*
RCA	*Right coronary artery.*
RCTs	*Randomized controlled trials*
S.C.	*Subcutaneous*
SBP	*Systolic blood pressure*
SSRI	*Selective serotonin re-uptake inhibitors*
STEMI	*ST elevation myocardial infarction*
SWMAs	*Segmental wall motion abnormalities*
TAO	*Thromboangiitis obliterans*
TAPAS	*Thrombus Aspiration during Percutaneous coronary intervention in acute myocardial infarction*
TCAs	*Tricyclic antidepressants*
TIAs	*Transient ischaemic attacks*
UFH	*Unfractionated heparin*
URL	*Upper reference limit*

Abstract

Background: tramadol has been in clinical use in Germany since the late 1970s and has proven effective in both experimental and clinical pain without causing serious cardiovascular or respiratory side effects. However, electrocardiogram ST segment elevation is found among people who take Tramadol, especially for people who are female, 60+ old, have been taking the drug for < 1 month, also take medication Aspirin, and have Arrhythmias. **Aim of the Work:** the aim of this study was to determine the prevalence of Tramadol users in STEMI patients. **Patients and Methods:** this cross-section study was designed and conducted in the Cardiovascular Diseases Unit at Ain Shams University hospitals on one thousand (1000) patients presenting to Ain Shams University hospital with STEMI at coronary care unit. **Results:** in the present study there was highly significant evidence relation between Tramadol users and STEMI depended on the amount and duration of the Tramadol dose. **Recommendations:** the present study confirms the relation between Tramadol users and STEMI. However, further studies are needed to assess the thrombogencity effect of Tramadol on the coronary and cardiovascular system.

Key words: tramadol, STEMI, cardiovascular diseases

Protocol
Prevalence of Tramadol users in STEMI

Protocol of Thesis

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Introduction

A ST elevation myocardial infarction (STEMI) most commonly occurs when thrombus formation results in complete occlusion of a major epicardial coronary vessel. The most serious form of acute coronary syndromes, STEMI is a life-threatening, time-sensitive emergency that must be diagnosed and treated promptly via coronary revascularization, usually by percutaneous coronary intervention (PCI). [(1)]

Unlike unstable angina and non-ST segment elevation myocardial infarction (NSTEMI), during STEMI the 12-lead ECG will show significant ST elevation as the name implies. [(2)]

ST segment elevation myocardial infarction usually present withAnginal symptoms at rest that result in myocardial necrosis as identified by elevated cardiac biomarkers with ST segment elevation on the 12-lead electrocardiogram. [(3)]

The Killip Classification is frequently used to predict mortality during STEMI. This system focuses on physical examination and the development of heart failure to predict the risk. [(4)]

The Pathophysiology of STEMI due to the “vulnerable plaque” that formed from the atherosclerotic process which is responsible for acute coronary syndromes and ultimately, coronary artery thrombosis is the endpoint. [(5)]

A substance known as "tissue factor" is located within the necrotic core of the plaque. When exposed to the bloodstream, tissue factor activates the clotting cascade and thrombosis occurs. Tissue factor is exposed when the fibrous cap that covers the plaque becomes disrupted or ulcerated. This disruption of the fibrous cap is called "plaque rupture" or "plaque erosion". Surprisingly, plaque rupture and thrombosis frequently occurs at the site of modest coronary stenosis (less than 50% luminal narrowing), thus even if stress testing is normal (which detects flow limiting stenosis of > 70%), the risk of an acute coronary syndrome is still present. [6]

The physical examination findings during STEMI are similar to those of stable angina, unstable angina and NSTEMI, however frequently more severe due to the larger amount of myocardium experiencing ischemia. [7]

Physical examination findings are relatively non-specific. The heart rate and blood pressure may be elevated due to increased sympathetic tone or the blood pressure can be low due to cardiogenic shock depending on the extent of the STEMI. [7]

An S4 heart sound may be present during myocardial ischemia due to the lack of ATP production impairing left ventricular relaxation.[7]

During inferior ischemia, posteromedial papillary muscle

dysfunction can cause mitral regurgitation resulting in a holosystolic murmur at the cardiac apex radiating to the axilla.[7]

The diagnosis of STEMI is predominantly using the 12-lead ECG and cardiac enzymes. There is significant myocardial necrosis occurring in the setting of STEMI resulting in elevation of the cardiac enzymes. [8]

Cardiac enzymes (cardiac biomarkers) include myoglobin, troponin and creatine kinase. [8]

ST segment elevation can take many forms during STEMI, however there some non-cardiac causes of ST segment elevation that need to be recognized. Also, the development of a new left bundle branch block is considered equivalent to a STEMI. [8]

ST segment elevation, unlike depression, will localize to the ECG lead of the affected myocardium. Note that 1 mm of ST elevation in 2 contiguous leads is required to diagnose STEMI, however there are two major exceptions:

1- Anterior STEMI requires 2 mm of ST elevation in V2 and V3 in men > 40 years old or 1.5 mm in women according to the ACC/AHA definition.2-Posterior STEMI frequently has ST depression in V1-V3 instead of elevation since the vectors are completely reversed. [8]

The treatment of STEMI includes prompt

revascularization and medical therapy. Revascularization can be performed by either primary percutaneous coronary intervention (PCI), fibrinolytic therapy (thrombolytic therapy) or surgically. Primary PCI is preferred if available within a reasonable time-frame (door-to-balloon less than 90 minutes). **(9)**

Initial medical therapy during STEMI consists of oxygen administration, antiplatelet therapy (aspirin, thienopyridines and glycoprotein IIb/IIIa inhibitors), anticoagulation (heparin or bivalirudin), anginal pain relief with nitrates and morphine, and beta-blockade. Medical therapy upon hospital discharge may include ACE inhibitors, angiotensin receptor blockers, aldosterone antagonists and HMG CoA reductase inhibitors. **(10)**

Tramadol (marketed as Ultram, and as generics) is an opioidpain medication used to treat moderate to moderately severe pain.(11) When taken as an immediate-release oral formulation, the onset of pain relief usually occurs within about an hour.**(12)** It has two different mechanisms. First, it binds to the μ-opioid receptor. Second, it inhibits the reuptake of serotonin and norepinephrine.**(13)(14)**

Serious side effects may include seizures, increased risk of serotonin syndrome, decreased alertness, and drug addiction.**(11)** The risk of serotonin syndrome appears to be low.**(15)**

Common side effects include:

1. Cardiac disordersare palpitations, tachycardia and

arrhythmia.

2. Vascular disorders consist ofhypertension and hot flush.
3. Respiratory disorder isdyspnea.
4. Renal and urinary disorders: albuminuria, micturition abnormality(dysuria and urinary retention).
5. Nervous system disorders: dizziness, somnolence, headache, trembling, involuntary muscular contractions, paraesthesia, ataxia, convulsions and syncope.
6. Gastrointestinal disorders: Nausea, vomiting, constipation, dry mouth, diarrhea,abdominal pain, dyspepsia, flatulence, dysphagia andmelaena.
7. Psychiatric disorders: Confusional state, mood altered, anxiety, nervousness, euphoric mood, sleep disorders, depression, hallucinations, nightmares, amnesia, drug dependence and Abuse.
8. Skin and subcutaneous tissue disorders:hyperhidrosis, pruritus, dermal reactions (e.g. rash, urticaria).
9. Eye disorder isblurred vision, Ear and labyrinth disorders aretinnitus.
10. Metabolism and nutrition disorders may present withHypoglycaemia.

References

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