Correlation between P Wave Dispersion, QRS Duration & QT Dispersion in Hospital Events in Cases of Acute Coronary Syndrome

Mahmoud Fekry Hassan Hassebo, M.B. B.Ch

Visiting Resident, Faculty of Medicine, Department of Critical Care Medicine, Alexandria University

*Corresponding author: Mahmoud Fekry Hassan Hassebo, M.B. B.Ch, Visiting Resident, Faculty of Medicine, Department of Critical Care Medicine, Alexandria University, Hospitals University of Alexandria, Egypt, E-mail: mahmoudhassebo@yahoo.com

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Aim of the Work

The aim of this work was to assess the correlation between P wave dispersion, QRS duration & QT dispersion in hospital events in patients with acute coronary syndrome (ACS).

Patients and Methods
Patients

This prospective study was conducted on 60 patients with acute coronary syndrome admitted to critical care units of Alexandria University Hospitals from first of January 2012 to end of August 2012.An informed consent was taken from relatives of every patient included in the study. This study was approved by ethical committee of Alexandria faculty of medicine.

Inclusion Criteria

The study included patients with Acute Coronary Syndrome (ACS) who had two from three of the following criteria:

• Clinical manifestation (Typical anginal pain usually with nausea and sweating).

• Electrocardiographic changes (ECG).

• Myocardial markers (CK, CKmb, Troponin I).

Exclusion Criteria:

Excluded from the study patients with any of the following:

ECG in which Q-T Interval could not be Assessed

1. Unclear QT interval in at least seven ECG leads.

2. Bigeminal ventricular systole, atrial fibrillation, a pacemaker.

3. Current drug use affecting QT interval e.g quinidine, Amiodarone, psychogenic agents (tricyclic antidepressant, tetracyclic agents).

4. Patients on hemodialysis.

5. Post Coronary Artery Bypass Graft (CABG).

The Patients Included in the Study will be Classified into Three Groups

Group 1: (ST Segment Elevation Myocardial Infarction with Successful Thrombolysis)

• Typical anginal pain.

• ST segment elevation in two or more contagious leads in ECG.

• High Cardiac enzymes.

• Signs of success after thrombolytic therapy (two from three):

1- Resolution of chest pain.

2- Regression of ST elevation by at least 50 % in ECG.

3- Occurrence of reperfusion arrhythmias (e.g. idioventricular rhythm).

Group 2: (ST Segment Elevation Myocardial Infarction with Failed Thrombolysis):

• Typical anginal pain.

• ST segment elevation in two or more contagious leads in ECG.

• High Cardiac enzymes.

• Signs of failure after thrombolytic therapy :

1. Resistant chest pain.

2. No regression of ST elevation by at least 50% in ECG.

3. No Occurrence of reperfusion arrhythmias.

Group 3: (Unstable Angina)

• Typical anginal pain.

• ECG changes (without ST segment elevation).

• Negative cardiac enzymes.

Methods

Full history taking including

• Age.

• Sex.

• Character of pain.

• Medical history including: Diabetes Mellitus, Hypertension, Previous heart disease & Drug intake.

Clinical Examination including:

• Pulse rate (beat/min).

• Blood Pressure (mmHg).

• Temperature (ºc).

• Chest & heart examination.

Electrocardiography: A 12-Lead ECG Record was done on Admission, before and after Thrombolytic (if given) and Once Daily till Discharge

A paper speed of 25 mm/s and amplification of 10 mm/mV was used for recording 12- lead ECG and the following parameters were calculated:

1. P wave Dispersion (PWD) is the difference between the longest (P max) & the shortest P wave duration (P min) recorded from multiple different surface ECG leads was calculated as (PWD = P max – P min) by milliseconds (ms).

2. QRS duration was measured (ms).

3. QT interval was calculated from the onset of the QRS complex to the point of return of the T wave to the isoelectric line. Three sequential complexes were measured and the mean value was used for QT interval calculation (ms).

The difference between the maximum and minimum QT intervals, occurring in any of the 12 leads, was measured as QTD. QTc max and QTc min will be determined with the Bazett formula ($QTc= QT /\sqrt{RR}$), and the difference between QTc max and QTc min was calculated as QTcD [10], together with assessment of other ischemic ECG change (T wave changes, S-T segment changes).

1 Cardiac markers [CPK (u/l), CK MB (u/l), Troponin I (ng/ml)] on admission and after six hours.

2 Plain chest X – ray

3 Management

Management

All patients were managed according to the following Protocol which includes:

Patients with ST segment elevation myocardial infarction (STEMI) will receive:

1. Oxygen (3-5 l / min).

2. Morphine (4mg I.V. As a pain killer).

3. Nitroglycerine (sublingual then intravenous titrated according to response).

4. Antiplatelets (Acetyl salycilic acid 81mg 4 tablets on admission then once daily and clopidogrel 75 mg 4 tablets on admission then once daily).

5. Thrombolytic therapy (streptokinase in a dose of 1.5 million units over one hour).

6. Anticoagulants (low molecular weight heparin e.g. enoxaparine 1 mg/kg).

Patients with unstable angina will receive

The same treatment except thrombolytic therapy

Outcome as Regards

Every patient was followed up for five days (patients who died before fifth day will be excluded due to

insufficient data needed for follow up):

1. Duration of stay in ICU.

2. Morbidity: dysrhythmias, heart failure, cardiogenic shock, mechanical ventilation.

3. Mortality

Statistical Method

Records of the studied cases and the results obtained after proposed procedure were statistically analyzed using SPSS 16.0 under Microsoft Windows XP. Continuous data were expressed in the form of mean ± SD. Categorical variables were expressed in the form of number and percent. One way ANOVA were utilized to compare numerical data. Chi-square test was used to compare categorical data as appropriate.

Correlation was done between quantitative and qualitative variables using Spearman correlation test and scatter dot graph.