بسم الله الرحمن الرحيم

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بقسم التوثيق الإلكتروني بمركز الشبكات وتكنولوجيا المعلومات دون أدنى مسئولية عن محتوى هذه الرسالة.

ملاحظات:
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Demographic and Angiographic Findings of Egyptian Young Adults Presenting With ST-Elevation Acute Myocardial Infarction

Thesis

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Amir Adel Alsayed

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List of Abbreviations

Abb.	Full term

AMI ..... *Acute myocardial infarction*

ApoA1 ..... *Apolipoprotein A1*

ApoB ..... *Apolipoprotein B*

CAD ..... *Coronary artery disease*

CASS ..... *Coronary Artery Surgery Study*

CI ..... *Confidence interval*

cTn ..... *Cardiac Troponin*

DM ..... *Diabetes mellitus*

FAAH..... *Fatty acid amide hydrolase*

H2O2 ..... *Hydrogen peroxide*

HDL..... *High density lipoprotein*

HDL-C ..... *High-density lipoprotein-cholesterol*

HS ..... *Highly significant*

HTN ..... *Hypertension*

IC ..... *Intracoronary*

IHD ..... *Ischemic heart disease*

LDL..... *Low density lipoprotein*

LDL-C ..... *Low density lipoprotein cholesterol*

LV ..... *Left ventricular*

MAGL..... *Monoacylglycerol lipase*

METC..... *Mitochondrial electron transport chain*

MINOCA ..... *Myocardial infarction without obstructive coronary artery disease*

NADPH..... *Nicotinamide adenine dinucleotide phosphate*

List of Abbreviations *(Cont...)*

Abb.	Full term
non-HDL-C	*Non-high density lipoprotein cholesterol*
NOS	*Nitric oxide synthase*
NS	*Non-significant*
OR	*Odds ratio*
PAFs	*Population attributable fractions*
RR	*Relative risk*
S	*Significant*
SCAD	*Spontaneous coronary artery dissection*
SD	*Standard deviation*
SPSS	*Statistical program for social science*
STEMI	*ST-elevation myocardial infarction*
TIMI	*Thrombolysis in Myocardial Infarction*
THC	*Tetrahydrocannabinol*
URL	*Upper reference limit*

INTRODUCTION

Ischemic heart disease (IHD) is the world's leading cause of mortality, accounting for 16% of all deaths. This disease has shown the highest increase in deaths since 2000, increasing by more than 2 million to 8.9 million deaths ***(Global Health Estimates, 2019).***

Ischemic heart disease's devastating form is ST-elevation myocardial infarction (STEMI), which might result in premature death. STEMI can affect young men or women, although it is more common in the elderly. Luckily, it rarely affects people under the age of 45. When it develops at a young age, unfortunately, the condition has a high morbidity, psychological consequences, and financial implications for the patient and the family. Increased prevalence of risk factors for IHD in youth, such as smoking, obesity, and sedentary lifestyle, has significantly undermined the protection provided for young population ***(Egred et al., 2005).***

Egypt, like many other countries, has a double disease burden: a persisting, significantly reduced, communicable illness burden and a huge, fast expanding noncommunicable illness burden. Egypt's main cause of death is ischemic heart disease, according to epidemiological data from WHO in 2019 ***(Global Health Estimates, 2019).***

The prevalence of STEMI among young Egyptians is rising. Recently Shaheen et al noted that the mean age of MI in Egyptians is lower than in other nations ***(Shaheen et al., 2020)***. This is a serious trend that has gained a lot of attention because of its distinct characteristics and the negative impact it has on youth' active lifestyle.

Aim of the Work

To establish a prospective registry for young adults less than 40 years old presenting with STEMI and undergoing primary PCI at Ain Shams University Hospitals from 2017 to 2019 to determine their incidence rate, risk factors and angiographic findings in comparison to patients more than 40 years old presenting with STEMI in the same period.

REVIEW OF LITERATURE

Myocardial Infarction in Young Adults

STEMI diagnoses have been on the rise in recent years among young population, which attracts special attention due to its unique features and overwhelming impact on their active lifestyle ***(Hosseini et al., 2009).*** INTERHEART and Euroheart ACS epidemiologic studies, along with randomized controlled trials have shown that certain risk factors and baseline features, such as family history, obesity, hyperlipidemia, and smoking are more potent predictors of outcomes in the young than in their older counterparts ***(Yusuf et al., 2004).***

Epidemiology:

Because the clinical profile of atherosclerotic and nonatherosclerotic phenotypes is poorly established, prevalence estimates differ. Premature coronary artery disease is estimated to affect 2-11% of hospitalized myocardial infarction patients, according to data from numerous studies ***(Hosseini et al., 2009).***

The ten-year follow-up data from the Framingham Heart Study revealed that the incidence of MI was 12.9, 38.2, and 71.2 per 1000 in men and 2.2, 5.2, and 13.0 per 1000 in women in the age groups 30 to 34, 35 to 44, and 45 to 54 years, respectively ***(Gulati et al., 2020).***

Pathophysiology of acute MI:

Acute myocardial infarction (AMI) is defined as acute myocardial injury with clinical evidence of acute myocardial ischemia and with detection of a rise and/or fall of Cardiac Troponin (cTn) values with at least one value above the 99th percentile Upper reference limit (URL) and at least one of the following:

- Cardiac ischemic symptoms.
- Novel ECG changes of ischemia.
- Pathological Q waves.
- New loss of viable myocardium by imaging or new segmental wall motion abnormality in presence of ischemic etiology.
- Detection of a coronary thrombus by angiography or postmortem ***(Thygesen et al., 2018).***

We use ECG to distinguish Patients with STEMI from those with NSTEMI because each category has different strategy in management. So, in the clinical context of acute myocardial infarction, we diagnose STEMI using ECG with new ST elevation at the J point in at least 2 contiguous leads of ≥2 mm (0.2 mV) in men (≥ 0.25 mV in men < 40 years) or ≥1.5 mm (0.15 mV) in women in leads V2–V3 and/or of ≥1 mm (0.1 mV) in other contiguous chest leads or the limb leads. There are atypical ECG presentations like acute LBBB in which we

use Sgarbossa criteria, in addition, ST depression in ≥ 2 precordial leads (V1–V4) may indicate transmural posterior injury; multi-lead ST depression with coexistent ST elevation in lead aVR has been described in patients with left main or proximal left anterior descending artery occlusion **(*Ibanez et al., 2018).***

Plaque rupture is most often associated with acute coronary events, and the detection of coronary atherosclerotic plaques that are prone to rupture, termed vulnerable plaques. Pathological studies demonstrated that the atherosclerotic plaque type most likely to rupture is a thin-cap fibroatheroma, which is distinguished by a large necrotic core covered by a thin layer of fibrous cap early in the atherosclerotic process, with only minimal fatty infiltration in the arterial wall. The necrotic core expands in volume as a result of many causes, including macrophage infiltration and death, as well as intraplaque bleeding with free cholesterol produced from erythrocyte membranes. An ultrathin (mean thickness 23 m) layer of fibrous tissue devoid of smooth muscle cells separates the necrotic core from the circulating blood, which is then invaded by macrophages and T-lymphocytes at the site of disruption. Plaque formation, continuing inflammation within the fibrous cap, external sheer stress, and other variables may have a particularly negative impact on the fibroatheroma's "thinnest zone," which may tear and expose the highly thrombogenic material to the bloodstream. With the help of