

**Trends in Percutaneous Coronary Intervention
in Cardiology Department Cairo University;
A Registry**

Thesis Submitted For Partial Fulfillment of Master Degree in Cardiology

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Trends in Percutaneous Coronary Intervention in Cardiology

Department Cairo University, A registry

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Abstract

OBJECTIVES: To perform a comprehensive PCI registry at Cairo University Hospitals (Al-Kasr Al-Aliny), including; Baseline demographic and clinical characteristics, Indications for PCI, Initial Assessment and Investigations, Angiographic findings, Percutaneous intervention, materials, devices, and complications, Medication at the time of PCI and at discharge, Short term in-hospital outcome, , and Adherence to existing guidelines.

BACKGROUND: Myocardial revascularization has been an established mainstay in the treatment of CAD, PCI has witnessed significant technological advances, with significant variation in the availability of resources between countries and within centers in the same country that may influence PCI outcome.

Registry data are extremely important because of the information on patients who are frequently left out of clinical trials. Additionally, the registries allow an assessment of the acceptance and practice of new treatments by the medical community that tends to resist change despite supportive evidence and guideline recommendations for new types of therapy.

Therefore, this registry gives a more realistic picture of our patient population profile that underwent PCI in the Cairo University Hospitals. Awareness of our reality may help the medical community adhere more strictly to the standard protocol set by international guidelines.

METHODS: We did prospectively registry from the beginning of January 2014 till the end of June 2014, of 272 patients who underwent PCI at Cairo University Hospitals (Al-Kasr Al-Aliny), and met the inclusion criteria were enrolled in the study.

RESULTS: Of the 272 patients enrolled for PCI, 106 (39%) presented with (STEMI), 31 (11.4%) with (NSTEMI), non-ST segment elevation MI (NSTEMI) in 31 (11.4%), UA was present in 33 (12.1%), and elective in 102 (37.5%). The mean age of these patients was 56.15 ± 8.53 , more than two thirds of the patients were males 196 (72.1%). Hypercholesterolemia was the most prevalent risk factor detected in 224 patients (82.35%), 83.5% of PCI patients were overweight/obese (42.3% / 41.2%),

hypertension was present in 198 patients (72.8%), smoking was present in 185 patients (68%) [current 134 (49.2%), former 51 (18.8)], most of them were male 179 (96.2%), and diabetes mellitus was found in 140 patients (51.1%). Femoral artery access the most frequently used technique (98.5% vs 1.5%) for radial access. Primary PCI was performed with a median door-to-balloon time of 3.72 hr for nontransfer patients. The majority of patients received medical therapy that is currently recommended by the guidelines. There was no significant difference between paid and free sections in the percent of use of DES to BMS. In-hospital mortality was 2.6%, it was 4.7% among ST elevation ACS (reached 7% of primary STEMI), 3.1% among Non ST elevation ACS (3.2% among NSTEMI, 3% among Unstable Angina), and non (0%) among elective patients. The general success rate was 95.5%, for non CTO lesions was 97.3% vs 61% for CTO lesions.

CONCLUSIONS: This registry has enabled us to determine the incidence and characteristics of PCI patients in Cairo-Egypt. Data of the PCI Registry provides a contemporary view of the current practice of invasive cardiology in the Cairo university hospitals. It has also showed us some obstacles that we need to overcome for the full implementation of published guidelines for the management of PCI patients. Dyslipidemia, hypertension, smoking, diabetes mellitus, and obesity are the risk factors associated with CAD, and that can be modified, treated, or controlled by changing lifestyle or taking medicine. The incidence of STEMI among Acute Coronary Syndrome patients is relatively high in Egyptian patients, and at a young age. Our results clearly demonstrate a good concordance between existing guidelines for medication at the time of PCI and medication at discharge. But also clearly demonstrate the discordance between existing guidelines for the time to PCI in Acute Coronary Syndrome, especially Non ST elevation ACS. There was no significant difference between paid and free sections of our hospitals, The Cairo University Hospitals (Al-Kasr Al-Ainy), in the percent of use of DES to BMS in CAD patients underwent PCI. In-hospital mortality rate in our registry was comparable with that reported in developed countries, also there is an improvement in the mortality rate in our hospitals. The success rate, and outcomes of PCI in our registry are as good as international standards, and outcomes.

Key words

Trends in Percutaneous Coronary Intervention in Cardiology Department Cairo University; A Registry

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List of Abbreviation

ACC	American College of Cardiology
ACCF	American College of Cardiology Foundation
ACE-I	angiotensin- converting enzyme inhibitor
ACS	acute coronary syndrome
ADP	Adenosine diphosphate
AF	atrial fibrillation
AHA	American Heart Assosiation
ARBs	angiotensin II receptor blockers
ARCA	anomalous origin of the RCA from the left coronary sinus
ASA	acetyl salicyclic acid
AV	arteriovenous
BMI	body Mass Index
BMS	bare metal stent
CABG	coronary artery bypass grafting
CAD	coronary artery disease
CARDS	Cardiology Audit and Registration Data Standards
CHD	coronary heart disease
CHF	congestive heart failure
CFR	coronary flow reserve
CKD	chronic kidney disease
COR	class of recommendation
CRF	chronic renal failure
CRP	C-reactive protein
CTO	chronic total obstruction
CVD	cardiovascular disease
DALY	disability adjusted life years
DAPT	dual antiplatelet therapy
DCA	directional coronary atherectomy
DES	drug-eluting stent
Diag	diagonal artery
DIDO	door-in– door-out
dLAD	distal LAD artery
DM	diabetes mellitus
dRCA	distal right coronary artery conduit
DTB	door to balloon
EACTS	European Association for Cardio-Thoracic Surgery
EES	everolimus eluting stent
EHS–ACS-I	first Euro Heart Survey of Acute Coronary Syndromes
EHS–ACS-II	second Euro Heart Survey of Acute Coronary Syndromes
ELCA	excimer laser coronary atherectomy
EMS	emergency medical service
EP	electrophysiology
GDMT	guideline directed medical therapy
GEA	gastroepiploic artery
ESC	European Society of Cardiology
HDL	high-density-lipoprotein cholesterol
HBP	high blood pressure
HTN	hypertension
FDA	food and Drug Administration
FFR	fractional flow reserve
FMC	first medical contact
FMCTB	first medical contact to balloon
ICD	implantable cardioverter defibrillator

List of Abbreviation

IMA	internal mammary artery
ISA	incomplete stent apposition
ISR	intra stent restenosis
IVUS	intravascular ultrasonography
JL	judkins left
JR	judkins right
LAD	left anterior descending
LAO	left anterior oblique
LCA	left coronary artery
LCX	left circumflex
LDL	low-density-lipoprotein cholesterol
LIMA	left internal mammary artery
LM	left main
LMCA	left main coronary artery
LMWH	low molecular weight heparin
LOE	level of evidence
LV	left ventricular
LV EF	lt ventricular Ejection Fraction
MACE	major adverse cardiac events
mCIRC	mid circumflex artery
MI	myocardial infarction
mLAD	mid-LAD artery
mRCA	mid-right coronary artery conduit
NCDR	National Cardiovascular Data Registry
NHANES	National Health and Nutrition Examination Surveys
NSTACS	non-ST elevation acute coronary syndrome
NSTEMI	non-ST elevation myocardial infarction
OCT	optical coherence tomography
OM	obtuse marginal
PAD	peripheral artery disease
PCI	percutaneous coronary intervention
pCIRC	proximal circumflex coronary
PES	paclitaxel-eluting stent
pLAD	proximal LAD artery
pRCA	proximal right coronary artery conduit
PTCA	percutaneous transluminal coronary angioplasty
RAO	right anterior oblique
RCA	right Coronary Artery
RCTs	randomized clinical trials
RIMA	right internal mammary artery
rPDA	right posterior descending artery
SES	sirolimus-eluting stents
STEMI	ST segment elevation myocardial infarction
SVG	saphenous vein graft
TIMI	Thrombolysis In Myocardial Infarction
TLF	target lesion failure
TLR	target lesion revascularization
TTE	transthoracic echocardiograph
TVR	target vessel revascularization
UA	unstable angina
UFH	un fractionated heparin
WestNP-ACS	Western Nepal acute coronary syndrome
ZES	zotarolimus-eluting stents

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Introduction

Cardiovascular diseases (CVDs) are the leading cause of deaths worldwide, more people die annually from CVDs than from any other cause, an estimated 17.3 million people died from CVDs in 2008, representing 30% of all global deaths.¹ Of these deaths, an estimated 7.3 million were due to coronary heart disease (CHD),² CHD remains responsible for about one-third of all deaths in individuals over age 35.^{3,4} It has been estimated that nearly one-half of all middle-aged men and one-third of middle-aged women in the United States will develop some manifestation of CHD.⁵ Though since the 1970s, cardiovascular mortality rates have declined in many high-income countries,^{6,7} At the same time, cardiovascular deaths and disease have increased at a fast rate in low- and middle-income countries:⁸ over 80% of CVD deaths take place in low- and middle-income countries and occur almost equally in men and women.¹ The number of people who die from CVDs, mainly from heart disease and stroke, will increase to reach 23.3. million by 2030.^{1,6} CVDs are projected to remain the single leading cause of death.⁹

Myocardial revascularization has been an established mainstay in the treatment of CAD for almost half a century. Coronary artery bypass grafting (CABG), used in clinical practice since the 1960s, is arguably the most intensively studied surgical procedure ever undertaken, while percutaneous coronary intervention (PCI), used for over three decades, has been subjected to more randomized clinical trials (RCTs) than any other interventional procedure. PCI was first introduced in 1977 by Andreas Gruentzig and by the mid-1980s was promoted as an alternative to CABG.¹⁰

While PCI have witnessed significant technological advances, in particular the use of drug-eluting stents (DES), low Profile balloons, newer coronary guide wires and guiding catheters, and adjunct diagnostic and therapeutic devices, significant variation in the availability of resources between countries and within centers in the same country do exist and may influence PCI outcome.¹⁰

PCI Registry data gives a more realistic picture of the patient population profile that underwent PCI, and are extremely important because of the information on patients who are frequently left out of clinical trials. Additionally, the registries

allow an assessment of the acceptance and practice of new treatments by the medical community that tends to resist change despite supportive evidence and guideline recommendations for new types of therapy. Awareness of our reality may help the medical community adhere more strictly to the standard protocol set by international guidelines.

The Cardiology Audit and Registration Data Standards (CARDS) project aimed to agree data standards for three modules of a cardiovascular health information system, Acute coronary syndrome (ACS), Percutaneous coronary interventions (PCI), and clinical Electrophysiology (EP) (pacemakers, implantable cardioverter defibrillators and ablation procedures).¹¹

The PCI data standards structure of CARDS were subdivided into the following sections; Demographics, History (relevant to CAD), Risk factors (relevant to CAD), Investigations for CAD, Percutaneous Coronary Intervention, Medication during PCI, Outcome, Medication at discharge, and Follow up.

A registry was needed in Egypt to collect such information's on PCI patients, and to gather information's on PCI practice in a tertiary referred hospitals which can be used for quality improvement.

Aim of Work

- 1- Determine the variation of indications for coronary revascularization among patients presenting to the different sections of Cardiology Department, Faculty of Medicine, Cairo University.
- 2- Determine the adherence to existing guidelines of indications to perform a PCI.
- 3- Determine the type of equipment and technology used for PCI procedures.
- 4- The use of medical adjunctive treatment during, and after PCI.
- 5- Assess the immediate and inhospital outcome of patients undergoing PCI.

REVIEW OF LITERATURE