Everolimus eluting stent; short term clinical follow up in patients with Acute Coronary Syndrome

Thesis

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Abstract

Background: In Egypt the most common use for drug eluting stent is the off label category and whether there is a difference between the off label category and the on label category for the patient with acute coronary syndromes (ACS) in the short term follow up.

Aim of the study: To determine the difference between the on label and the off label use of everolimus eluting stent

Methods: the patient with acute coronary syndromes was followed up clinically for six months and if there is recurrent chest pain the patient will do another coronary angiography to evaluate the deployed stent.

Results: 95 patients was included in the registry 50 patient (52.6%) of them was off label and 45 patient (47.4 %) of them was on label , 4 patients (4.2%) with instent restenosis, 4 patients (4.2 %) with graft stenting, 10 patient (10.5%) with lesions more than 28 mm, 3 patients (3.1%) with Left Main stenting,7 patients (7.3 %) with osteal lesion , 7 patients (7.3%) with bifurcation stenting , 1 patient (1.1 %) with CTO, 5 patients (5.2 %) with multi vessel disease , 5 patients (5.2 %) with thrombus containing lesion , 4 patients (4.2 %) with more than one type of drug eluting stent .

Conclusion: there is no difference in MACE between the on label and the off label indication for DES usage in the patients with ACS in the short term clinical follow up

Key Words: Acute coronary syndrome

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List of Abbreviations

ACC ·····	American College of Cardiology
ACS ·····	Acute coronary syndrome
AMI ·····	Acute myocardial infarction
BMS……	Bare Metal Stent
CABG…….	Coronary artery bypass grafting
CHD·····	Coronary heart disease
CVD·····	Cardiovascular diseases
DES…….	Drug Eluting Stent
EHS-ACS·····	Euro Heart survey for Acute Coronary Syndrome
ESC·····	European Society of Cardiology
mTOR……..	Mamalian target of rabamycin
MLD…….. ··	Minimal Lumen Diameter
NSTEMI ·····	Non ST segment elevation myocardial infarction
PCI……...	Percutaneous coronary intervention
SK ·····	Streptokinase
STEMI ·····	ST segment elevation myocardial infarction
TIMI·····	Thrombolysis in myocardial infarction
TLR·····	Target Lesion Revascularization

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Introduction

Few areas of medicine have evolved as rapidly as coronary artery revascularization procedures. Percutaneous coronary intervention, which began as an experimental procedure, is now performed in more than one million patients per year in the United States alone. After their approval by the U.S. Food and Drug Administration, drug-eluting stents were so rapidly assimilated that the devices were used in 80% to 90% of revascularization procedures in the United States in 2005. However, reports of an increased incidence of late stent thrombosis, defined as thrombosis occurring more than 30 days after implantation, have raised concerns about a safety tradeoff with this technology[(1)].

The pivotal clinical trials were for the most part restricted to low-risk patient and lesion subsets that are not completely representative of those seen in routine clinical practice. Specifically, the "on-label" indications for use of drug-eluting stents include only symptomatic patients with ischemic disease due to a single de novo lesion less than thirty mm in native coronary arteries, with a reference vessel diameter of 2.5 to 3.5 mm[(1)]. Because the use of bare-metal stents in more complex lesion and patient subgroups is typically associated with higher rates of restenosis, many interventionists have hypothesized that the efficacy of drug-eluting stents may be more pronounced in this population, with greater absolute reductions in repeated revascularization. Initial data from some of the pivotal randomized studies that included more complex lesion subsets have demonstrated this benefit ([1]). Additional studies are emerging about the use of drug-eluting stents for various "off-label" indications, including acute myocardial infarction (MI), chronic total occlusion, in-stent restenosis, diffuse disease, saphenous vein grafts,

bifurcation lesions, and left main coronary artery stenting. In addition, several ongoing registries have provided "real-world" data that show favorable long-term outcomes and statistically significant reductions in major adverse cardiac events ([2]).

Subgroup analyses from all clinical trials and numerous registries have demonstrated that implantation of drug-eluting stents reduces angiographic and clinical restenosis to a similar extent in all analyzed patients and lesion subgroups ([3],[4]). In fact, higher-risk patients may experience a greater absolute reduction in revascularization because of their higher baseline risk for restenosis. Given that the rate of serious adverse events (death and MI) has not been demonstrated to differ from that for bare-metal stents (although studies have been underpowered to assess these end points as well), and considering that drug-eluting stents are very effective in the reduction of repeated revascularization, the net clinical benefit of drug-eluting stents appears to be favorable ([5],[6],[7]).

Everolimus is a derivative of the limus family, a sirolimus analogue with a single minimal alteration in its molecular structure (position 40), without a chemical modification of the mTOR binding domain ([8]). Of interest is that, when implanted in rabbit iliac arteries, a more rapid endothelialization was observed in the everolimus-eluting stent as compared with sirolimus-, zotarolimus-, or paclitaxel-eluting stents, demonstrated by a complete endothelialization of the struts with exhibition of cd31 (antigen surface marker of good endothelial functionality) in the cells at 14 days (R. Virmani, MD, unpublished data, 2006).

Everolimus is an agent that is used in heart transplantation as it has been shown to reduce chronic allograft vasculopathy in such transplants.

It may also have a similar role to sirolimus in kidney and other transplants ([9]).

The Clinical Evaluation of the Everolimus Eluting Coronary Stent System in the Treatment of Patients with de novo Native Coronary Artery Lesions First (SPIRIT) trial proved the superiority of everolimus embedded in a durable polymer on a cobalt chromium stent as compared with bare metal stents (BMS).([10],[11]) In the recently completed SPIRIT-II trial, proved to be superior to the Paclitaxel Eluting Stent for reduction of both late loss and binary restenosis. ([12]) Subsequently, the SPIRIT-III trial has randomized 1002 patients in the US to treatment with either an Everolimus Eluting Stent or a Paclitaxel Eluting Stent. As part of the SPIRIT-III study, additional patients will also be enrolled in 4 registry arms in Japan,

Aim of The Work

To study the safety, efficacy and acute angiographic outcome of the new Everolimus Eluting Stent with correlation to short-term clinical follow up in patient with ACS.