5-year outcomes in patients with acute coronary syndrome treated with biodegradable polymer sirolimus-eluting stents versus durable polymer everolimus-eluting stents

J.F. Iglesias[1], D. Heg[2], M. Roffi[3], D. Tueller[4], O. Muller[5], I. Moarof[6], S. Cook[7], D. Weilenmann[8], C. Kaiser[9], M. Valgimigli[10], P. Juni[11], S. Windecker[10], T. Pilgrim[10]

[1]Geneva University Hospitals, Geneva, Switzerland; [2]Bern University Hospital, Institute of Social and Preventive Medicine and Clinical Trials Unit, Bern, Switzerland; [3]Geneva University Hospitals, Cardiology, Geneva, Switzerland; [4]Triemli Hospital, Cardiology, Zurich, Switzerland; [5]University Hospital Centre Vaudois (CHUV), Cardiology, Lausanne, Switzerland; [6]Cantonal Hospital Aarau, Cardiology, Aarau, Switzerland; [7]University of Fribourg, Cardiology, Fribourg, Switzerland; [8]Kantonsspital, Cardiology, St Gallen, Switzerland; [9]University Hospital Basel, Cardiology, Basel, Switzerland; [10]Bern University Hospital, Inselspital, Cardiology, Bern, Switzerland; [11]St. Michael's Hospital, Toronto, Canada

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Background: Newest generation drug-eluting stents (DES) combining ultrathin cobalt chromium platforms with biodegradable polymers may reduce target lesion failure (TLF) as compared to second generation DES among patients with acute coronary syndrome (ACS). While previous studies indicated a potential benefit within the first two years after percutaneous coronary intervention (PCI), it remains uncertain whether the clinical benefit persists after complete degradation of the polymer coating.

Purpose: To compare the long-term effects of ultrathin-strut biodegradable polymer sirolimus-eluting stents (BP-SES) versus thin-strut durable polymer everolimus-eluting stents (DP-EES) for PCI in patients with ACS.

Methods: We performed a subgroup analysis of ACS patients included into the BIOSCIENCE trial (NCT01443104), a randomized trial comparing BP-SES with DP-EES. The primary endpoint of the present post-hoc analysis was TLF, a composite of cardiac death, target vessel myocardial infarction (MI) and clinically indicated target lesion revascularization (TLR), at 5 years.

Results: Among 2,119 patients enrolled between March 2012 and May 2013, 1,131 (53%) presented with ACS (ST-segment elevation myocardial infarction, 36%). Compared to patients with stable CAD, ACS patients were younger, had a lower baseline cardiac risk profile, including a lower prevalence of hypertension, hypercholesterolaemia, diabetes mellitus, and peripheral artery disease, and had a greater incidence of previous revascularization procedures. At 5 years, TLF occurred similarly in 89 patients (cumulative incidence, 16.9%) treated with BP-SES and 85 patients (16.0%) treated with DP-EES (RR 1.04; 95% CI 0.78–1.41; p=0.78) in patients with ACS, and in 109 patients (24.1%) treated with BP-SES and 104 patients (21.8%) treated with DP-EES (RR 1.11; 95% CI 0.85–1.45; p=0.46) in stable CAD patients (p for interaction=0.77) (Figure 1, Panel A). Cumulative incidences of cardiac death (8% vs. 7%; p=0.66), target vessel MI (5.2% vs. 5.8%; p=0.66), clinically indicated TLR (8.9% vs. 8.3%; p=0.63) (Figure 1, Panel B-D), and definite thrombosis (1.4% vs. 1.0%; p=0.57) at 5 years were similar among ACS patients treated with ultrathin-strut BP-SES or thin-strut DP-EES. Overall, there was no interaction between clinical presentation and treatment effect of BP-SES versus DP-EES.

Conclusion: In a subgroup analysis of the BIOSCIENCE trial, we found no difference in long-term clinical outcomes between ACS patients treated with ultrathin-strut BP-SES or thin-strut DP-EES at five years.