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Eugenio Stabile, Fabio Magliulo, Drago Zhelev, Vassil Chervenkoff, Kim Taeymans, Peter Goverde, Maria Angela Losi, Giuseppe Giugliano, Bruno Trimarco, Giovanni Esposito

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Correspondence

Interim analysis at 6 months from the LEG-flow Drug Eluting Balloon for the treatment of femoropopliteal occlusions (LEG-DEB) registry

Eugenio Stabile [a,*], Fabio Magliulo [a], Drago Zhelev [b], Vassil Chervenkoff [c], Kim Taeymans [d], Peter Goverde [d], Maria Angela Losi [a], Giuseppe Giugliano [e], Bruno Trimarco [a], Giovanni Esposito [a]

[a] Department of Advanced Biomedical Sciences, University Federico II, Naples, Italy
[b] Vascular Surgery Clinic, UMBAL Sv. Georgi EAD, Plovdiv, Bulgaria
[c] Department Vascular Surgery and Angiology, Tokuda Hospital Sofia, Bulgaria
[d] Vascular Clinic ZNA Hospital Stuivenberg, Antwerp, Belgium
[e] Coronary Care Unit, Clinica Montevergine, Mercogliano, Italy

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Patients with lower limb atherosclerosis due to femoropopliteal disease may suffer from critical limb ischaemia or life-limiting claudication and may have multiple comorbidities limiting a surgical therapeutic option. Today, in these cases, balloon angioplasty (PTA) is a valuable therapeutic approach, but its long-term efficacy is hampered by the occurrence of restenosis of the treated arterial segment. This event is even more frequent in patients with critical limb ischaemia (CLI) (Rutherford Class >4) due to the presence of more pronounced systemic inflammation [1].

The use early generation drug-coated balloons (DCB) has shown promising results in the prevention of post-PTA restenosis in the femoropopliteal artery in randomized clinical trials [2]. However, these trials mostly enrolled patients with claudication (Rutherford Class ≤4) and thus do not provide any data on the device's therapeutic efficacy in CLI patients. Moreover, the devices used in these trials have several unsolved technical limitations such as inconsistent drug coating concentrations, significant drug loss prior to treatment, use of large paclitaxel (PTX) particles which increases the risk of embolization, and excessive initial balloon-artery drug transfer rates resulting in early drug-in-tissue concentrations which are too high. All these limitations reduce the therapeutic efficacy of the drug released onto the arterial wall, and hamper clinical efficacy in challenging conditions (*i.e.* CLI patients).

In order to overcome these limitations, a new generation DCB has been developed, which is covered with a homogenous and stable surface coating using extremely small, non-visible PTX particles, and which does not require the use of an extra DCB protection and insertion tool [3]. There is scant information on the efficacy of new generation DCB in the treatment of femoropopliteal obstructions in "real world" patients (including both patients with claudication and with CLI) [4]. The aim of this multi-centre, prospective registry was to evaluate the safety and efficacy, at six months, of a new generation PTX DCB (LEGFLOW®, Cardionaovum) for the treatment of femoropopliteal artery disease in a "real-world" setting.

From 01/2014 to 06/2015, 123 consecutive patients undergoing PTA of the superficial femoral artery and/or popliteal artery were enrolled in four different European institutions. All patients underwent PTA with LEGFLOW balloons. Among the treated patients, 79 (64.2%) were treated for claudication and 44 (35.8%) for CLI. In total, 76 (61.8%) patients underwent PTA for *de novo* lesions (mean lesion length (MLL) 95.1 ± 57.0 mm), 26 (21.1%) patients for restenosis (MLL 96.1 ± 32.1 mm) and 21 (17.1%) patients for in-stent restenosis (MLL 114.3 ± 24.1 mm).

The primary endpoint of primary patency at 6 months was defined as the absence of clinically-driven target lesion revascularization (TLR) and binary restenosis (>50%) assessed by angiography or duplex ultrasonography (DUS) if angiography was unavailable. Pre-specified secondary endpoints were death, cardiovascular mortality, minor and major amputation, and clinical and haemodynamic success. Patients were evaluated at baseline through angiography, and at 1, 6, 12 and 24 months by a phone call. As required by protocol, an interim analysis was conducted at 6 months, and is reported here.

All procedures were successful in terms of angiographic and clinical success. Technical and procedural success was achieved in all patients. At 6 months, two patients died for non-cardiovascular causes (1.6%). Freedom from TLR was obtained in 88.6% of all patients (Table 1). Freedom from TLR in patients with claudication was obtained in 93.6% and in patients with CLI 79.5%. Analysing the results according to lesion characteristics, freedom from TLR in patients with *de novo* lesions was obtained in 88.1% and in patients with restenosis 80.7%; no TLR was

* Corresponding author at: Division of Cardiology, Department of Advanced Biomedical Sciences, "Federico II" University, Napoli, Italy.
E-mail address: geko50@hotmail.com (E. Stabile).

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Table 1
Efficacy data at six months after baseline procedure.

Freedom from TLVR:	n/N (%)
Overall	109/123 (88.6)
De novo lesions	67/76 (88.2)
Non in-stent restenosis	21/26 (80.8)
In-stent restenosis	21/21 (100)
Critical limb ischaemia	35/44 (79.5)
Claudication	74/79 (93.7)
Diabetics	52/60 (86.7)
Non-diabetics	57/63 (90.5)
Lesions Lenght<100 mm	56/63 (88.9)
Lesions lenght>100 mm	54/60 (90)

observed in patients with in-stent restenosis. Lesion length did not affect TLR rates but the presence of diabetes did.

The data suggests that the use of a new generation, PTX DCB for the treatment of femoropopliteal artery disease represents a safe and effective therapeutic strategy for the endovascular treatment of femoropopliteal obstructions in different clinical (*i.e.* diabetic patients) and anatomic settings (lesion length > 100 mm, restenosis, in-stent restenosis). It should be noted that this study is the first to report the efficacy of a DCB in patients with CLI [4]. In this registry, as expected for this complex patient subset, the LEGFLOW DCB appears to be slightly less successful when compared to the outstanding performance achieved by the DCB in claudicating patients. These data will need to be confirmed with longer-term follow-up.

Conflict of interest

The authors report no relationships that could be construed as a conflict of interest.

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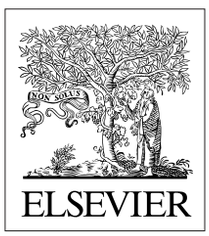

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