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New technologies in percutaneous coronary interventions: drug-coated balloons

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Twenty-five years after the introduction of stents into the armamentarium of percutaneous coronary intervention and less than 10 years after the introduction of drug-eluting stents, a new technology to avoid restenosis in coronary artery after angioplasty has become available: the drug-coated balloon.

While dual antiplatelet therapy has taken care of most of the acute re-occlusions after angioplasty, restenosis and acute stent thrombosis are still of significant importance and, in some patients, the duration of dual antiplatelet therapy is an issue. By avoiding implants and the foreign body reaction that follows, by applying the antiproliferative drug paclitaxel using appropriate carrier systems to invade the coronary artery wall within 20-30 seconds, neointimal hyperplasia is consistently diminished at the price of smaller acute gain compared to stenting.

This special supplement summarises the current knowledge on acute and intermediate term results after drug-coated balloon therapy, whether they are used together with a bare metal stent or as a standalone procedure. It presents the randomised clinical trials and registries as well as future targets and possibilities both in peripheral as well as in coronary vessels. Technical considerations reveal that drug carrier systems are mandatory to achieve sufficient drug levels in the vascular wall. Several carrier are available such as iopromide, urea and BTHC, while controlled clinical studies exist only on the iopromide formulation. Delivery of the coated balloons also awaits further improvement. Nevertheless, in this issue, the history of the development of drug-coated balloons and already established local drug delivery in the vascular tree are discussed. Promising new indications are presented here as well. While the treatment of in-stent restenosis with drug-coated balloons is already the gold standard, and treatment of small vessels is promising, the data on bifurcation lesions are still scarce. The concern of interventionalists that acute closure rates will increase with less stenting is not founded in experiences and research presented here. On the contrary, the safest therapy seems to be the drug-coated balloon without additional stenting. Theoretical considerations from the absence of reactions to a foreign body, to reduction of thrombosis rates, from side branch preservation due to less carina shift in bifurcations to positive remodelling after the insult of balloon angioplasty under the effects of paclitaxel, all of these and more are fields outlined in this issue, though they all merit further research. Current recommended indications and modes of application are summarised at the end of this supplement, based on the conclusions of a recent German Consensus Group dedicated to this subject. While most of the participants of this group have personal experience numbering in the hundreds of procedures for each individual or group, the future development of this therapy could evolve quickly, and in ways that are presently unpredictable, especially in the face of the upcoming bioabsorbable vascular scaffolds, that aim for similar goals as we deal with here, but with totally different tools.

We hope that this special supplement of EuroIntervention will help guide us through the path leading to an exciting new era in percutaneous interventions.

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