**ABSTRACTS - Angiography & Interventional Cardiology 21A**

**1052-186 Safety and Efficacy of Sirolimus-Eutting Stent (cypher) in Acute Myocardial Infarction: A study of the Rapamycin-Eutting Stent Evaluation at Rotterdam Cardiology Hospital (RESEARCH) Study**

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Background: Cypher stent restores restenosis in stable pts with simple lesions. Our aim is to assess the safety and efficacy of cypher stent in AMI pts.

Methods: AMI pts admitted for PCI during the 6 mths period (16th Apr-15th Oct 02) were screened for eligibility for cypher stent. AMI pts who underwent PCI during the prior 6 mths (15th Oct 01-15th Apr 02) were recruited as historic control.

Results: Up to 27th Aug 02, totally 92 AMI pts (presented within 6 hrs) were screened and 66 (72%) were recruited (cypher gp). These 66 accounted for 17% of the 384 pts who entered the RESEARCH study during the same period. Baseline for selection were stent diameter unavailable (n=17), length unavailable (n=1) or physician preference (n=8). Among pts (70% male) in the cypher gp, the average age was 66+14 yrs. Risk factors were smoking (24%), DM (7.6%), HT (52%), hypercholesterolemia (52%) and adverse family history (33%). Peak CK was 3367+/-2239 IU/L. Anterior MI accounted for 50% of infection. Average 1.5 stents (1-5) were implanted per pt. Majority (80%) received 3-mm diameter stent. Post-procedural diameter stenosis by QCA was 66+31%.

Conclusion: Cypher stent is safe and effective in reducing the repeat revascularization rate in pts presented with AMI.

**1053-174 Effective Stent-Based Delivery of Tissue Inhibitor of Metalloproteinase 3 To Porcine Coronary Arteries Using a Novel Biosynthetic Stent Coating**

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Background: In-stent restenosis continues to pose a problem for the longterm success rate of percutaneous coronary intervention. We aimed to develop a suitable vehicle for the local delivery of a therapeutic adenovirus to coronary arteries, resulting in overexpression of tissue inhibitor of metalloproteinase 3 (TIMP3). TIMP3 is known to induce apoptosis of vascular smooth muscle cells, thus reducing neointima formation.

Method: We used a Matrix HI phosphorylcholine coated (PC) stent (Biocompatibles, Farnham, U.K.), with enhanced calciumion to increase viral transduction efficiency to porcine coronary arteries. Preliminary studies to evaluate the coating & optimal viral dosing were performed with uncoated and PC stainless steel coupons. Subsequently, adenoviruses pre-treated with β-Galactosidase adenovirus, were implanted, in porcine coronary arteries & flushed with 1 of 5 solutions - no flush, 0.9% saline, contrast media, blood or culture medium (25 for each group). The stented arteries were cultured for 48hours, fixed & stained with X-Gal to confirm viral transduction. Transduction was quantified using Image Pro. Invivo transduction was first assessed with β-Gal PC-stents in porcine coronaries & following this, TIMP3 stents were implanted for up to 7 days. Harvested tissues were analysed for presence of virus & gene product using PCR & immuno-histchemical methods.

Results: PC-stainless steel coupons showed superior β-Gal transduction rates compared to uncoated stents. Invivo transduction rates were; No Flux 9.5±3.7%, 0.9% Saline 0.6±2.6%, 0.9% Culture Medium 7.2±2.6%, 0.9% Blood 7.4±2.6%, 0.9% Biodex 16.2±9.3%. Invivo, we demonstrated localized transduction of β-Gal, & more importantly, TIMP3 without systemic distribution of the virus, up to 7 days after implantation.

Conclusion: Our results demonstrate effective & localised production of adenovirus from a stent using a novel biosynthetic coating, already licensed in humans. Additionally, we demonstrated effective & localised production of TIMP3 in stented coronaries. The combination of TIMP3 & a PC stent is a potentially attractive candidate for the prevention of in-stent restenosis.

**1053-176 Endovascular Cryotherapy Increases Luminal Area in the Focally Atherosclerotic Hypercholesterolemic Rabbit**

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Background: There is recent interest in the use of cryotherapy to treat atherosclerotic lesions. The objective of this study was to characterize the effects of endovascular cryotherapy on vessel wall components in the hypercholesterolemic, focally atherosclerotic rabbit.

Methods: Bilateral focal temporal atherosclerosis was induced by air desiccation in twenty New Zealand White rabbits. Animals were then placed on a 0.5% cholesterol diet for 28 days. Utilizing a cryo-balloon system, vessels underwent a sham procedure (n=10) or cryotherapy at 4 temperatures: 20°C (n=4), 10°C (n=8), 0°C (n=8), and +10°C (n=10). Animals were placed on a chow diet for 28 days post cryotherapy at which time animals were euthanized and arteries harvested for analysis.

Results: Vessels treated at +10°C had significantly larger external elastic lamina (EEL) and luminal area (2.13±0.12 mm² vs. 1.23±0.16 mm², p<0.0004; 0.85±0.10 mm² vs. 0.51±0.12 mm², p=<0.00) together with a higher macrophage content and lower total vessel collagen content compared with sham controls (26.6±4.9 % vs. 20.7±8.0 %, p<0.01, 52.3±3.3 % vs. 50.3±3.2 %). Vessels in the other groups were not different from sham controls although a trend for larger EEL area (1.78±0.25 vs. 1.23±0.16 mm², p=0.37) and a trend for increased intramural/mural collagen content (44.74±6.9 % vs. 34.8±6.9 %, p=0.15) were seen at -10°C. The cross sectional area of narrowing by plaque (CSAN-P) and smooth muscle cell content were similar among groups.

Conclusions: Endovascular cryotherapy at +10°C significantly increases luminal and EEL area of focally atherosclerotic arteries without a change in CSAN-P, consistent with a positive remodeling effect. Furthermore, there were more macrophages and less collagen deposition in these vessels, which may have facilitated positive remodeling. A trend for increased EEL area was also seen at -10°C as well as increased collagen content and smooth muscle cell content. Further studies of this novel technique utilizing various treatment temperatures and regimens are currently in progress.