Local and distal PTX effects: Preclinical results with different DCBs

Raphaël COSCAS & Auréline BOITET
Ambroise Paré University Hospital and Paris-Ouest University
Boulogne-Billancourt, France
Disclosure

Speaker name:
Raphaël COSCAS

I have the following potential conflicts of interest to report:

☐ Consulting: Spectranetics, Terumo, Medtronic
☐ Employment in industry
☐ Stockholder of a healthcare company
☐ Owner of a healthcare company
☐ Other(s)

☐ I do not have any potential conflict of interest
All DCBs are created different

<table>
<thead>
<tr>
<th></th>
<th>Lutonix Bard</th>
<th>IN.Pact Medtronic</th>
<th>Ranger Boston</th>
<th>Stellarex Spectranetics</th>
<th>Passeo-18 Lux Biotronik</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTX Dose</td>
<td>2</td>
<td>3,5</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Excipient</td>
<td>Polysorbate Sorbitol</td>
<td>Urée</td>
<td>Citrate ester</td>
<td>Polyethylene glycol</td>
<td>BTHC</td>
</tr>
<tr>
<td>PTX Formulation</td>
<td>Hybrid Crystalline + amorphous</td>
<td>Crystalline</td>
<td>Microcrystalline</td>
<td>Hybrid Microcrystalline + amorphous</td>
<td>Microcrystalline</td>
</tr>
<tr>
<td>Technique of PTX deposition</td>
<td>Pulverization</td>
<td>Micro-pipetting</td>
<td>Pulverization</td>
<td>Pulverization</td>
<td>Micro-pipetting</td>
</tr>
<tr>
<td>Balloon state during deposition</td>
<td>Inflated</td>
<td>Inflated</td>
<td>Deflated</td>
<td>Inflated</td>
<td>Deflated</td>
</tr>
</tbody>
</table>
Advantages and drawbacks of crystalline PTX

- Crystals enter the arterial wall and serves as long term PTX reservoir
- It allows sustained anti-proliferative effects

Torii et al., J Endovasc Ther 2017
Distal embolization of crystalline PTX causes fibrinoid necrosis with serious clinical consequences.

Ibrahim T et al., JACC Cardiovasc Interv 2016
Thomas SD et al., J Vasc Surg 2014
Drug-Eluting Balloon Versus Standard Balloon Angioplasty for Infrapopliteal Arterial Revascularization in Critical Limb Ischemia
12-Month Results From the IN.PACT DEEP Randomized Trial

Embolization of PTX particles?

8.8% vs 3.6%; p = 0.080

Zeller et al. IN.PACT DEEP Trial, JACC 2014
Experimental approach

5 different DBCs x 5 specimens each = 25 rabbits
Experimental approach

• Sacrifice H2
• Samples
  – Aorta
  – Plasma
  – DCB
  – Muscles
    • Thigh: TFL, Vastus lateralis
    • Leg: Tibialis cranialis

• Blinded dosage PTX by high pressure liquid chromatography
PTX in the 3 muscles

- Vastus lateralis (ng/mg)
- Tensor fasciae latae (ng/mg)
- Tibialis cranialis (ng/mg)
PTX in the muscles (global)

Total muscles (ng/mg)

- Lutonix
- In.Pact
- Ranger
- Stellarex
- Passeo-18-Lux
PTX in the aortic wall

Aortic wall (ng/mg)
PTX in the Plasma

Plasma (ng/mL)
Remnant PTX on the DCB

![Bar graph showing remnant PTX on the DCB with different balloon actuators. The y-axis represents Aortic wall (ng/mg) ranging from 0 to 4000. The x-axis represents different balloon actuators: Lutonix, In.Pact, Ranger, Stellarex, and Passeo-18-Lux. The * symbol indicates a significant difference.](image-url)
Conclusions

• DCBs have different embolization and local penetration profiles in this pre-clinical study.

• Stellarex and Ranger DCBs seem to have the best profiles, whereas embolization rates with In.Pact and Lutonix DCBs were concerning.

• These results may have implications while choosing a DCB, especially for BTK and/or CLI.
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