Variations in the Usage and Composition of a Radial Cocktail during Radial Access Coronary Angiography Procedures

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Abstract
A survey was conducted of medication administered during radial artery cannulation for coronary angiography in 2009 in Ireland; responses were obtained for 15 of 20 centres, in 5 of which no radial access procedures were undertaken. All 10 (100%) centres which provided data used heparin and one or more anti-spasmodics; verapamil in 9 (90%), nitrate in 1 (10%), both in 2 (20%). There were significant variations in the doses used. Further work needs to be done to determine the optimum cocktail to prevent radial artery injury following coronary angiography.

Introduction
The radial artery is becoming the preferred means of access for coronary angiography and intervention. This is primarily because there is a much lower incidence of vascular access complications compared with the femoral approach, and has been facilitated by technical advances leading to smaller calibre catheters and equipment.

However, catheter manipulation can be restricted or prevented by radial artery spasm which may be quite painful, and rarely injury to the artery caused by cannulation results in long-term occlusion (0.5%). There seems to be little additional benefit in combining two agents in the intra-arterial cocktail. However, though an argument can be made for using sublingual nitrate to vasodilate the radial artery to facilitate initial cannulation prior to intra-arterial cocktail administration, this has never been examined.

Discussion
Verapamil and heparin constituted the commonest medications used to reduce the risk of complications during radial artery procedures in Ireland in 2009. However, the doses used and whether these were mixed as a cocktail, or given separately, varied between operators, centres and even between operators in the same centre. As regards vasodilation, multiple studies have been published using nitrate, verapamil, nifedipine and nicorandil, showing them to be more effective than placebo.

The dose of vasodilator was modified in some centres in situations of low blood pressure and/or bradycardia. However, in the majority of centres no reduction was made in the amount of vasodilator administered. There are no published data confirming that the small doses of vasodilators used result in systemic hypotension that leads to significant adverse effects, but it would seem sensible to avoid such problems; this issue warrants requires further exploration.

Table 1: Variations in the usage of radial cocktail during radial access coronary angiography.

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage of Centres</th>
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<tbody>
<tr>
<td>Heparin</td>
<td>100%</td>
</tr>
<tr>
<td>Verapamil</td>
<td>90%</td>
</tr>
<tr>
<td>Nitrate</td>
<td>70%</td>
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<tr>
<td>Pethidin</td>
<td>50%</td>
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<tr>
<td>Nifedipine</td>
<td>30%</td>
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<tr>
<td>Nicorandil</td>
<td>20%</td>
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</tbody>
</table>

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References