Effects of Iloprost on Microvascular Structure Assessed by Nailfold Videocapillaroscopy: A Pilot Study

To the Editor:

In patients with systemic sclerosis (SSc), both structural and functional abnormalities of the microvasculature occur1, often resulting in severe digital ischemia with ulceration, scarring, and sometimes even gangrene. The structural abnormalities are well demonstrated by nailfold capillaroscopy2, especially using high magnification videocapillaroscopy3, which allows measurement of capillary density and dimensions.

Intravenous (IV) prostanooids, such as iloprost and epoprostenol, are currently the mainstay of treatment for severe SSc-related digital ischemia4,5. In the UK, iloprost is most commonly used. As well as being a potent vasodilator, iloprost inhibits platelet aggregation and is thought also to have vascular remodeling properties6. A key issue is whether IV prostanooids might prevent or even reverse SSc-related microvascular changes; if so, this would be an indication to use these drugs more widely, especially in patients with early disease, in whom microvascular changes are more likely to be reversible than in those with well established problems. We performed a pilot study to investigate whether administration of IV iloprost was associated with structural changes in the digital microvasculature as quantified by nailfold videocapillaroscopy.

Nine patients with SSc (7 female) in whom IV iloprost was clinically indicated for the treatment of digital ischemia or digital ulceration were recruited, and a tenth patient with SSc in whom the indication for iloprost therapy for digital ischemia have been reported anecdotally7, although only a small section of the nailbed was illustrated. The quantitative method used in our study for tracking capillaries, although having the advantage of displaying the whole nailfold as a “mosaic”8, may have been relatively insensitive to change, in that dimensions were measured in only 5 capillaries. Also, we specifically selected 5 capillaries that were easy to measure, thus deliberately omitting some of the most abnormal loops, which may have been those most likely to demonstrate change. In addition, our study was observational and it is possible that iloprost may stabilize rather than improve capillary structure. This hypothesis could only be tested within a controlled trial.

We quantified capillary changes in relation to iloprost in SSc, using the unique window into the microcirculation provided by nailfold videocapillaroscopy to track change over time. While recognizing the limitations of a small observational study (including that other factors such as disease progression may influence the 12-month findings), nonetheless we believe our findings are potentially very relevant: being able to quantify treatment response in terms of an improvement in microvascular structure is a major step forward. Further studies, incorporating larger numbers of patients with different stages of SSc-spectrum disorders, more than one nailbed in each patient, and improved methods of quantifying capillary change, are the next step.

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### Table 1. Capillary dimensions and Raynaud’s visual analog scores before, during, and after intravenous iloprost treatment. Results are median (range).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Pre-Iloprost</th>
<th>Day 3 Iloprost</th>
<th>Immediately Post-Iloprost (Day 5)</th>
<th>12 Months Post-Iloprost</th>
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<tbody>
<tr>
<td>Capillary density/mm</td>
<td>6.0 (3.3–7.3)</td>
<td>6.5 (3.3–7.9)</td>
<td>6.9 (3.7–8.8)</td>
<td>6.2 (3.7–8.9)</td>
</tr>
<tr>
<td>Total capillary width, µm</td>
<td>94 (49–268)</td>
<td>97 (35–280)</td>
<td>96 (55–240)</td>
<td>78 (47–193)</td>
</tr>
<tr>
<td>Apical width, µm</td>
<td>37 (20–129)</td>
<td>36 (11–137)</td>
<td>31 (24–182)</td>
<td>28 (15–81)</td>
</tr>
<tr>
<td>Raynaud’s visual analog score, mm</td>
<td>59 (0–79)</td>
<td>22 (0–69)*</td>
<td>12 (3–72)</td>
<td>32 (10–83)</td>
</tr>
</tbody>
</table>

* Results from 7 patients only.
REFERENCES


J Rheumatol 2011;38:9; doi:10.3899/jrheum.110067