Loss of kidney function after endovascular treatment of peripheral artery disease (PAD)

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Disclosure

Speaker name: L.J.J. Bolt

I have the following potential conflicts of interest to report:

- Consulting
- Employment in industry
- Shareholder in a healthcare company
- Owner of a healthcare company
- Other(s)

☑️ I do not have any potential conflict of interest
Introduction

Global 202 million patients affected by peripheral artery disease (PAD)

First choice treatment in symptomatic PAD

Acute effects of radiocontrast administration on renal function have been well studied

Long-term effects of endovascular interventions for PAD remains to be investigated
Renal decline

Annual mean glomerular filtration rate (GFR) decline

Approximately 1mL/min/1.73m²

Fast decline

>4 mL/min/1.73m²

Increased mortality and cardiovascular events

We studied whether endovascular treatment of intermittent claudication is associated with long-term loss of renal function
Study design

Retrospective cohort
January 1st 2011 until July 31st 2013

Renal function (GFR)

Pre-procedural (maximum 6 months prior to intervention)
Post-procedural (two till six weeks post intervention)
One year post-procedural
In- exclusion criteria

**Inclusion**
New consecutive patients with symptomatic PAD, Rutherford 2-3
Endovascular treatment (PTA) or supervised exercise therapy (SET)

**Exclusion**
Non-compliance to SET
PTA in medical history
End-stage renal disease
Rutherford classification 4-6
PTA in the first year of follow-up
Patient enrolment

New patients presenting with symptomatic peripheral arterial disease at department of vascular surgery (N=1870)

Included (N=701)

Excluded (N=1169)
- Rutherford IV-VI (N=916)
- Acute ischemia (N=215)
- No baseline renal function test (N=23)
- End-stage renal disease (N=15)

- PTA (N=344)

Excluded (N=60)
- PTA in first year
- PCI in first year
- CT-A in first year

PTA (N=284)

- SET (N=357)

Excluded (N=58)
- PTA in first year
- PCI in first year
- CT-A in first year

PTA follow-up 1 year with renal function (N=208)

SET follow-up 1 year with renal function (N=203)
## Baseline characteristics

<table>
<thead>
<tr>
<th></th>
<th>PTA</th>
<th>SET</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>65</td>
<td>68</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>26</td>
<td>28</td>
<td>0.01</td>
</tr>
<tr>
<td>Rutherford Classification II</td>
<td></td>
<td></td>
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<tr>
<td>classification III</td>
<td>100</td>
<td>36</td>
<td>&lt;0.01</td>
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<tr>
<td>Baseline eGFR (mL/min)</td>
<td>75</td>
<td>69</td>
<td>&lt;0.01</td>
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<tr>
<td>Diabetes mellitus</td>
<td>15</td>
<td>33</td>
<td>&lt;0.01</td>
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<tr>
<td>Smoking</td>
<td>62</td>
<td>49</td>
<td>&lt;0.01</td>
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</tbody>
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*Data are presented as mean or as percentages.*
### Renal decline 1 year

<table>
<thead>
<tr>
<th></th>
<th>PTA</th>
<th>SET</th>
<th>P-value</th>
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<tbody>
<tr>
<td>Mean renal decline</td>
<td>SD</td>
<td>Mean renal decline</td>
<td>SD</td>
</tr>
<tr>
<td>Mean GFR decline</td>
<td>8.5 mL/min</td>
<td>10.6</td>
<td>1.8 mL/min</td>
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</table>
Multivariate regression

<table>
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<tr>
<th></th>
<th>Renal decline (mean difference)</th>
<th>P-value</th>
<th>Fast renal decline (OR)</th>
<th>P-value</th>
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<tbody>
<tr>
<td>PTA</td>
<td>7.4</td>
<td>&lt;0.01</td>
<td>9.0</td>
<td>&lt;0.01</td>
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<tr>
<td>Age</td>
<td>-</td>
<td>-</td>
<td>1.0</td>
<td>0.05</td>
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<tr>
<td>Heart Failure</td>
<td>-</td>
<td>-</td>
<td>7.4</td>
<td>&lt;0.01</td>
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<tr>
<td>Hypertension</td>
<td>1.9</td>
<td>0.03</td>
<td>1.8</td>
<td>0.01</td>
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<tr>
<td>GFR pre-operative</td>
<td>0.1</td>
<td>&lt;0.01</td>
<td>-</td>
<td>-</td>
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</table>
Conclusion

Symptomatic PAD patients undergoing PTA show a significant fast renal decline compared to patients treated non-invasive with SET.

PTA for peripheral arterial disease are associated with clinically relevant permanent loss of kidney function observed after one year.

These risks are particularly important in PAD patients undergoing repeated contrast-enhanced procedures for diagnostic, therapeutic, or surveillance purposes.
Questions ??

Thank you for your attention!