



**Cochrane**  
**Library**

Cochrane Database of Systematic Reviews

## Lumbar sympathectomy versus prostanoids for critical limb ischaemia due to non-reconstructable peripheral arterial disease (Review)

Sen I, Agarwal S, Tharyan P, Forster R

Sen I, Agarwal S, Tharyan P, Forster R.

Lumbar sympathectomy versus prostanoids for critical limb ischaemia due to non-reconstructable peripheral arterial disease.

*Cochrane Database of Systematic Reviews* 2018, Issue 4. Art. No.: CD009366.

DOI: [10.1002/14651858.CD009366.pub2](https://doi.org/10.1002/14651858.CD009366.pub2).

[www.cochranelibrary.com](http://www.cochranelibrary.com)

**Lumbar sympathectomy versus prostanoids for critical limb ischaemia due to non-reconstructable peripheral arterial disease (Review)**

Copyright © 2018 The Cochrane Collaboration. Published by John Wiley & Sons, Ltd.

**WILEY**

[Intervention Review]

# Lumbar sympathectomy versus prostanoids for critical limb ischaemia due to non-reconstructable peripheral arterial disease

Indrani Sen<sup>1</sup>, Sunil Agarwal<sup>2</sup>, Prathap Tharyan<sup>3</sup>, Rachel Forster<sup>4</sup>

<sup>1</sup>Vascular Surgery, Christian Medical College, Vellore, India. <sup>2</sup>Surgery Unit II, Christian Medical College, Vellore, India. <sup>3</sup>Cochrane South Asia, Prof. BV Moses Center for Evidence-Informed Health Care and Health Policy, Christian Medical College, Vellore, India. <sup>4</sup>Usher Institute of Population Health Sciences and Informatics, University of Edinburgh, Edinburgh, UK

**Contact address:** Indrani Sen, Vascular Surgery, Christian Medical College, Vellore, Tamil Nadu, 632004, India. [dr.indranisen@gmail.com](mailto:dr.indranisen@gmail.com).

**Editorial group:** Cochrane Vascular Group.

**Publication status and date:** New, published in Issue 4, 2018.

**Citation:** Sen I, Agarwal S, Tharyan P, Forster R. Lumbar sympathectomy versus prostanoids for critical limb ischaemia due to non-reconstructable peripheral arterial disease. *Cochrane Database of Systematic Reviews* 2018, Issue 4. Art. No.: CD009366. DOI: [10.1002/14651858.CD009366.pub2](https://doi.org/10.1002/14651858.CD009366.pub2).

Copyright © 2018 The Cochrane Collaboration. Published by John Wiley & Sons, Ltd.

## ABSTRACT

### Background

Peripheral arterial disease (PAD) is a common circulatory problem that can lead to reduced blood flow to the limbs, which may result in critical limb ischaemia (CLI), a painful manifestation that occurs when a person is at rest. The mainstay of treatment for CLI is surgical or endovascular repair. However, when these means of treatment are not suitable, due to anatomical reasons or comorbidities, treatment for pain is limited. Lumbar sympathectomy and prostanoids have both been shown to reduce pain from CLI in people who suffer from non-reconstructable PAD, but there is currently insufficient evidence to determine if one treatment is superior. Due to the severity of the rest pain caused by CLI, and its impact on quality of life, it is important that people are receiving the best pain relief treatment available, therefore interest in this area of research is high.

### Objectives

To compare the efficacy of lumbar sympathectomy with prostanoid infusion in improving symptoms and function and avoiding amputation in people with critical limb ischaemia (CLI) due to non-reconstructable peripheral arterial disease (PAD).

### Search methods

The Cochrane Vascular Information Specialist (CIS) searched the Specialised Register (last searched 29 March 2017) and CENTRAL (2017, Issue 2). The CIS also searched clinical trials databases for ongoing or unpublished studies.

### Selection criteria

Randomised controlled trials (RCTs), with parallel treatment groups, that compared lumbar sympathectomy (surgical or chemical) with prostanoids (any type and dosage) in people with CLI due to non-reconstructable PAD.

### Data collection and analysis

Three review authors independently selected trials, extracted data and assessed risk of bias. Any disagreements were resolved by discussion. We performed fixed-effect model meta-analyses, when there was no overt sign of heterogeneity, with risk ratios (RRs) and 95% confidence intervals (CIs). We graded the quality of evidence according to GRADE.

### Main results

We included a single study in this review comparing lumbar sympathectomy with prostanoids for the treatment of CLI in people with non-reconstructable PAD. The single study included 200 participants with Buerger's disease, a form of PAD, 100 in each treatment group, but

**Lumbar sympathectomy versus prostanoids for critical limb ischaemia due to non-reconstructable peripheral arterial disease (Review)**

**1**

Copyright © 2018 The Cochrane Collaboration. Published by John Wiley & Sons, Ltd.

only 162 were actually included in the analyses. The study compared an open surgical technique for lumbar sympathectomy with the prostanoid, iloprost, and followed participants for 24 weeks.

Risk of bias was low for most evaluated domains. Due to the nature of the treatment, blinding of the participants and those providing the treatment would be impossible as a surgical procedure was compared with intravenous injections. It was not mentioned if blinded assessors evaluated the study outcomes, therefore, we judged subjective outcomes (i.e. pain reduction) to be at unclear risk of detection bias and objective outcomes (i.e. ulcer healing, amputation and mortality) at low risk of detection bias. We also rated the risk of attrition bias as unclear; 38 out of 200 (19%) participants were not included in the analysis without clear explanation (16 of 100 in the iloprost arm and 22 of 100 in the sympathectomy arm). The quality of evidence was low due to serious imprecision because the study numbers were low and there was only one study included.

The single included study reported on the outcome of complete healing without pain or major amputation, which fell under three separate outcomes for our review: relief of rest pain, complete ulcer healing and avoidance of major amputation. We chose to keep the outcome as a singularly reported outcome in order to not introduce bias into the outcomes, which may have been the case if reported separately. The limited evidence suggests participants who received prostaglandins had improved complete ulcer healing without rest pain or major amputation when compared with those who received lumbar sympathectomy (RR 1.63, 95% CI 1.30 to 2.05), but as it was the only included study, we rated the data as low-quality and could not draw any overall conclusions. The study authors stated that more participants who received prostaglandins reported adverse effects, such as headache, flushing, nausea and abdominal discomfort, but only one participant experienced severe enough adverse effects to drop out. Five participants who underwent lumbar sympathectomy reported minor wound infection (low-quality evidence). There was no reported mortality in either of the treatment groups (low-quality evidence).

The included study did not report on claudication distances, quality of life or functional status, ankle brachial pressure index (ABPI), tissue oxygenation or toe pressures, or progression to minor amputation, complications or provide any cost-effectiveness data.

### Authors' conclusions

Low-quality evidence from a single study in a select group of participants (people with Buerger's disease) suggests that prostaglandins are superior to open surgical lumbar sympathectomy for complete ulcer healing without rest pain or major amputation, but possibly incur more adverse effects. Further studies are needed to better understand if prostaglandins truly are more efficacious than open surgical lumbar sympathectomy and if there are any concerns with adverse effects. It would be of great importance for future studies to include other forms of PAD (as Buerger's disease is a select type of PAD), other methods of sympathectomy as well as data on quality of life, complications and cost-effectiveness.

## PLAIN LANGUAGE SUMMARY

### Lumbar sympathectomy versus prostanoids for critical limb ischaemia due to non-reconstructable peripheral arterial disease

#### Background

People with peripheral arterial disease (PAD) have narrowed arteries which means it can be difficult to get sufficient blood to the extremities of the body, especially the legs. This lack of blood flow (ischaemia) over a long period can become painful. The pain usually becomes apparent only when a person has been walking a certain distance (intermittent claudication), but as the disease progresses the lack of blood flow worsens and the person may experience extreme pain while at rest (critical limb ischaemia (CLI)). Generally, if a person's blood vessels are in good enough health and the person does not suffer other illnesses that could complicate general anaesthesia, surgical repair of the arteries is considered and could help reduce ischaemic pain. However, in some people such a repair is not advised or possible, and their pain relief options are limited. Lumbar sympathectomy, which can be carried out by surgical procedure or by injection of a chemical agent, and the use of intravenous prostaglandins (lipids which aid in recovery at sites of tissue damage or infection that are injected into the vein via a syringe or catheter), can help improve blood flow and reduce pain. Both have been shown to help reduce rest pain in people who cannot have surgical repair. It is unclear at this time which of these techniques is superior for pain reduction, ulcer healing, reduction in amputation or other outcomes important to people with CLI.

#### Study characteristics and key results

For this review we only identified one study that met the inclusion criteria (current until 29 March 2017). This study randomised 200 participants (162 included in analysis) and compared surgical lumbar sympathectomy with the prostaglandin, iloprost, in people with Buerger's disease, a form of PAD, and followed participants for 24 weeks. This study found evidence of increased complete ulcer healing without rest pain or major amputation in the participants who received intravenous prostaglandin compared with those that received surgical lumbar sympathectomy. However, those who received prostaglandins were more likely to report adverse events such as headache, flushing, nausea and abdominal discomfort. There were no reported deaths in either treatment group. The single included study did not report on other planned outcomes for this review such as walking distances and quality of life or functional status. The single study was limited to the specific form of PAD known as Buerger's disease, and to surgical lumbar sympathectomy, making it difficult to generalise the findings to all types of PAD and all methods of lumbar sympathectomy.

#### Quality of evidence

Overall, the study had little risk of bias due to design. Blinding of the participants and those that administered the treatment would be impossible, but there was no mention of blinding of the people who evaluated the outcomes, which would have been a possibility. Due to this, we rated the outcomes that had subjective measures (measures that can be influenced by or based on personal beliefs or feelings), such as relief of rest pain as unclear risk of bias, but the outcomes that had objective measures (measures that are not influenced by or based on personal beliefs or feelings) such as ulcer healing, amputation and mortality as low risk of bias. Also, there was a large number of participants not included in the analysis (38 of the 200, 19%), in both groups, with inadequate reasons as to why, so we rated bias due to incomplete outcome data as unclear. The quality of the evidence, therefore, was low for the outcomes evaluated as the number of participants included was low and only a single study reported evidence.