Reviewer’s report

Title: Vasodilative effects of prostaglandin E1 derivate on arteries of nerve roots in chronically compressed cauda equina

Version: 1 Date: 3 January 2008

Reviewer: Makoto Fukusaki

Reviewer’s report:

BMC Musculoskeletal Disorders

Reviewer’s Comments for the Author

Title of paper: Vasodilative effects of prostaglandin E1 derivate on arteries of nerve roots in chronically compressed cauda equina

General:

This study focuses on vasodilative effects of prostaglandin E1 (PGE1) derivate on nerve root arteries and veins in chronically compressed cauda equine model. The authors demonstrated that only the arteries dilated the diameter and increased the blood flow in nerve root after the oral administration of PGE1 derivate (OP-1206 Î±-CD). However, there are a lot of reports in which PGE1 has a direct dilative effect and an increasing effect of the blood flow in coronary, renal, hepatic and cerebral arteries. Concerning nerve root, Nakai K et al. demonstrated that oral treatment with OP-1206 Î±-CD improved spinal cord blood flow reduced at the territory of the stenosis and walking dysfunction in the rat neuropathic intermittent claudication model due to spinal stenosis (Anesth Analg 2002;94:1537-41). Yone K et al. (Spinal Cord 1999;37:269-74) and Kawauchi Y et al. (Spinal Cord 1996;34:3-10) performed myeloscopic observations of morphologic changes in blood vessels on the surface of cauda equine in patients with lumbar spinal stenosis who did and did not receive Lipo PGE1 (an emulsified PGE1); these investigators suggested that PGE1 may improve blood circulation in the cauda equine and resolve clinical symptoms in some patients with lumbar spinal stenosis. Fukusaki M et al reported that intravenous administration of PGE1 increased nerve root blood flow velocity (as measured by laser Doppler) after lumbar diskection in spinal stenosis patients (J Neurosurg Anesthesiol 2003;15:76-81). In the dose dependent study, PGE1 at the dose of 20 micg or less caused an increase in nerve root blood flow velocity and showed an improvement of neurologic symptoms in the condition post lumbar decompressive surgery (The Pain Clinic 2006;18:287-95).

The finding in this study that PGE1 increased the blood flow of nerve root arteries again comes as no surprise.

Therefore I think that this study is lacking creativeness.

Background;
No relevant information is available from your introduction.

PGE1 is known to be a potent vasodilator of small arterial vessels, either when applied topically, administered intravenously, or orally.

Nevertheless the authors conducted this study.

The hypothesis of this work is weak.

Methods;

The methods are well performed.

It has been established that this chronically compressed cauda equina model causes the reduction of nerve root vessels resulting in neurological intermittent claudication in previous reports.

One week after the initial surgery, OP-1206 Î±-CD was administered orally and study was conducted. How much was OP-1206 Î±-CD absorbed through stomach via a silicon catheter? How long is the half-life of OP-1206 Î±-CD?

How did you decide the dose of OP-1206 Î±-CD in this study?

Results;

The author should show the changes in diameter of blood vessels, blood flow velocity and blood flow index in sham operation model, too.

The author should display the values of vessels diameter, blood flow velocity and blood flow volume index on the table in either group.

Although the administration of OP-1206 Î±-CD gradually caused the arterial dilatation and the increase in arterial blood flow in the nerve roots, the author needs to observe the same indices in vehicle and sham models.

Discussion;

You cannot discuss about neurological intermittent claudication because you have no data in walking function of your study.

You should minutely discuss the possible pathomechanism of the increase in arterial blood flow of the nerve roots after the administration of PGE1. PGE1 has several systemic hemodynamic effects, i.e., positive inotropic and chronotropic actions, the increase of cardiac output, the reduction of systemic vascular resistance and inhibition of platelet aggregation. Its effect on hemodynamics is mainly due to dilation of resistance vessels. Fukuda H et al. (J Clin Anesth 2001;13:330-4) reported that PGE1 administration at a low infusion rate of 0.02 mcg/kg/min increased cardiac output without alterations in mean arterial blood pressure and blood volume during anesthesia, and the increase in cardiac output was mainly due to an increase in heart rate. Therefore PGE1 can change the arterial blood flow in the nerve roots due to primary and secondary effects. The author needs to add the conclusion section in this study.
**What next?:** Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

**Level of interest:** An article of limited interest

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.