Off-label Use of Calcitonin in the Treatment of Phantom Limb Pain: a Mini Case Series

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Background

Phantom limb pain (PLP) is a poorly understood syndrome where the etiology is still the subject of great debate. PLP is defined as "pain referred to a surgically removed limb or portion thereof", typically experienced within the first week after amputation in up to 80% of amputees.[1] Current treatment options include: ketamine, morphine, gabapentin, amitriptyline or calcitonin.[1]

Objective

To explore and describe the use of calcitonin in PLP.

Table 1: Patient details from case studies

	Case 1	Case 2
Age	76 years old	61 years old
Ethnicity	Caucasian	Asian
Gender	Male	Male
History	Type 2 Diabetes, Hypertension, Peripheral Vascular disease (PVD), Lung cancer, Dyslipidemia, Ischaemic Heart disease	Type 2 Diabetes
Reason for Below-knee amputation (BKA)	Left leg ischaemia secondary to PVD	Traumatic leg injury from MVA
Post- operative analgesia	• Patient controlled analgesia (PCA) IV fentanyl • ropivacaine 0.2% peripheral nerve block infusion • paracetamol PO 1g QID • oxycodone PO 2.5mg QID as required	• PCA Fentanyl IV • ropivacaine 0.2% peripheral nerve block infusion • paracetamol PO 1g QID • Oxycodone PO 2.5mg QID as required • pregabalin PO 50mg BD
Pain score post BKA	7/10	7/10
Pain score post adjunctive analgesics	3/10	2/10

Intervention

Calcitonin 100 International Units subcutaneously daily for 3 days as adjunctive therapy for PLP

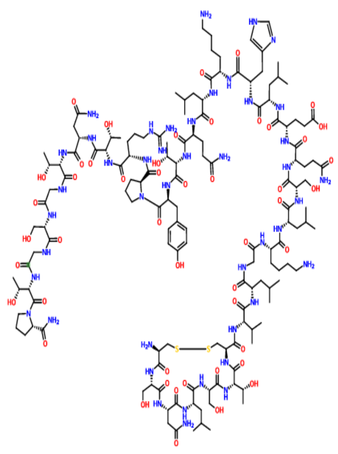

Figure 1. Molecular structure of calcitonin

Results

Case 1: Over the 3 day course of calcitonin, adjunct analgesia remained unchanged and the pain scored decreased from 7 to 3/10. A resolution of PLP was seen after completion of calcitonin therapy.

Case 2: Addition of pregabalin on day 2 of calcitonin therapy was required before a reduction in pain score from 7 to 2/10 was reported. After completion of calcitonin therapy, a reduction in frequency of PLP was reported.

Evidence

Emerging evidence supports the use of calcitonin in PLP although its mechanism of action is inconclusive. Current evidence is based on a small number of case reports and clinical trials. A Cochrane review in 2016 demonstrates the potential benefit of calcitonin in acute PLP compared to placebo however there were large variations in administration route, dosing and post-operative adjunct analgesia.[4] Studied routes of administration have included IV, epidural and intranasal. The Australian and New Zealand College of Anesthetists (ANZCA) guideline supports the possible role of calcitonin in the management of acute PLP but more evidence is required in chronic PLP.

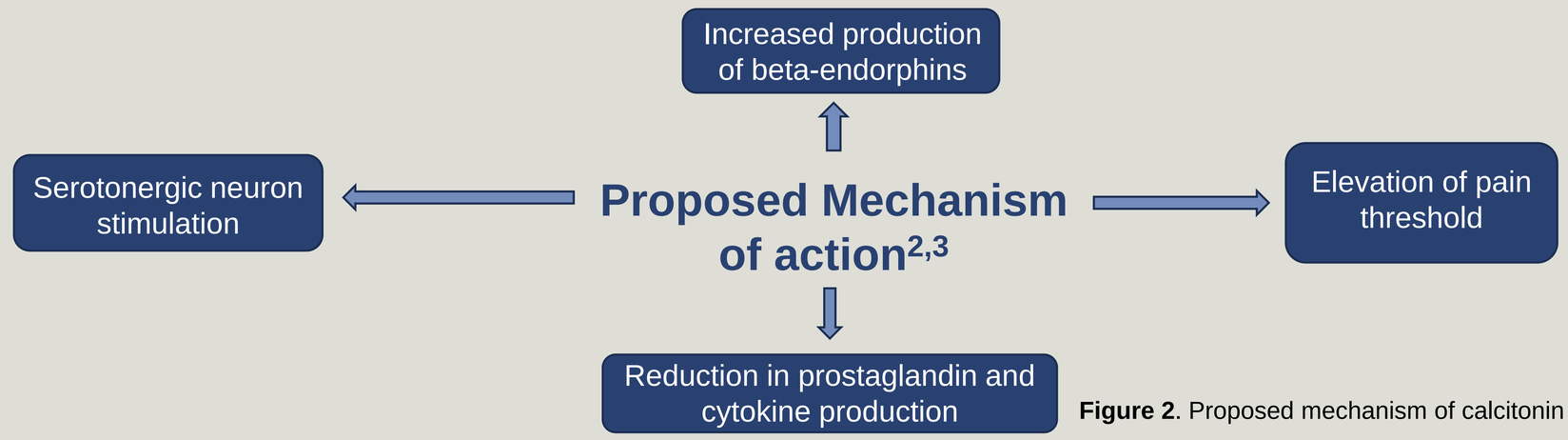

Figure 2. Proposed mechanism of calcitonin in PLP

Conclusion

There is currently little evidence regarding the optimal dosage, route of administration and efficacy of calcitonin in PLP. Furthermore, the limited evidence is restricted to the IV, epidural and intranasal routes. The successful use of subcutaneous calcitonin for PLP has not been reported however its safe use is postulated due to its use in other indications as well as having a more favourable side effect profile and ease of administration than other routes.

Our 2 cases support the safe use of subcutaneous calcitonin in PLP. Therapy was shown to be effective and well tolerated with no side-effects reported. However long-term follow-up is needed as evidence for a sustained impact is unclear due to non-standardised postoperative analgesic regimens. Further research, larger and more rigorous randomised controlled trials are required to reach more definitive conclusions to optimise dosing, improve patient outcomes and guide future practice.

References

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