

Nocturnal leg cramps: is there any relief?

Nocturnal leg cramps are common, particularly in older people and in women who are pregnant. The condition is characterised by painful cramps in the legs or feet, that affect sleep quality. Is there an effective treatment? Unfortunately, treatment options are limited, but lifestyle modifications and gentle stretching may have some effect. Pharmacological treatment may be considered for people with frequent, severe leg cramps, however, quinine is no longer recommended.

What are nocturnal leg cramps?

A nocturnal leg cramp is a sudden contraction of muscles in the leg or foot during sleep. This painful tightening of the muscle can last from a few seconds to several minutes. Cramps often cause waking, and although the cramps themselves are benign, the affected muscle may be painful for some hours afterwards and the consequences of sleep impairment can be considerable.

Severe nocturnal cramps are characterised by painful, incapacitating episodes, which last on average for nine minutes, and recur intermittently throughout the night.¹ This can lead to secondary insomnia and impaired day-time functioning. Approximately 20% of people who experience regular nocturnal cramps have symptoms severe enough to affect sleep quality or require medical attention.¹

Nocturnal cramps are common, with a lifetime prevalence of between 50 – 60% in adults and approximately 7% in children.¹ Nocturnal leg cramps, particularly calf cramps, are common in women who are pregnant, and are considered a normal part of pregnancy.²

The cause of nocturnal cramps for many people is unknown; however, dehydration, electrolyte and mineral imbalances, muscle fatigue and reduced peripheral blood flow have been suggested as possible contributing factors.

Factors known to be associated with an increased risk of nocturnal cramping, include:¹

- Age over 50 years
- Pregnancy
- Exercise, particularly over-exertion
- Leg positioning, e.g. prolonged sitting with legs crossed, tight bed covers which cause the toes to point downwards
- Excessive consumption of alcohol
- Chronic dehydration
- Structural disorders, e.g. flat feet or other foot and ankle malformations
- Medicines, e.g. diuretics (especially thiazide and potassium-sparing diuretics), some anti-inflammatories (e.g. naproxen), long-acting beta-2 agonists, statins, opioids, raloxifene (used in osteoporosis) and lithium
- Co-morbidities, e.g. osteoarthritis, vascular diseases, cirrhosis, diabetes, Parkinson's disease, hypo- and hyperthyroidism

Nocturnal cramps are diagnosed clinically

The patient's description of their symptoms is usually sufficient to diagnose nocturnal leg cramps, e.g. the patient may describe a sudden onset of painful cramping of the leg or foot muscles that wakes them from sleep.

The history (including a review of medicines) and a focussed physical examination can help to identify any underlying conditions that may be causing or contributing to the leg cramps (Table 1). Examination should include blood pressure measurement and neurological and vascular examination of the legs.¹

Laboratory investigations, such as electrolyte levels, are not routinely required, unless there are relevant findings in the history and examination, e.g. investigation of serum calcium would be considered in a patient with numbness in the feet and tetany (continuous involuntary muscle contractions).¹

Treatment of nocturnal leg cramps

The aim of treatment of nocturnal cramps is symptom control, unless an underlying cause has been identified and can be managed. Lifestyle modifications to prevent the cramp from occurring can be trialled first. If the patient remains symptomatic and symptoms are severe, pharmacological

treatment may be considered. However, there is currently no pharmacological treatment for leg cramps that has been proven to be both safe and significantly effective.¹


Acute management

Patients should be given advice on what to do when they experience a cramp. Physically stretching the muscle that is cramping, e.g. for cramp in the calf, flexing the ankle by pulling the toes upward in the direction of the shin, is the most effective way of stopping the cramp, but this can be painful.³ Passive stretching may also be effective and is less painful: this involves relieving the tension on the affected muscle by massage and postural changes.³ Getting out of bed and briefly walking may also provide relief.

There is no evidence of benefit of other acute management strategies, but patients may have their own methods that, if safe, can be encouraged, e.g. having a hot shower or placing a wheat bag or an ice pack on the affected leg.

Table 1: Important differential diagnoses of nocturnal leg cramps¹

| Signs and symptoms | Diagnosis to consider |
|--|--|
| Aching, deep pain that may be similar to cramping, often brought on by exercise and relieved by rest | Intermittent claudication |
| Aching, deep pain unrelated to exercise; general weakness; history of statin use | Myositis, myalgias, Bakers cysts, deep vein thrombosis |
| Non-painful repetitive leg movements that impede sleep | Restless leg syndrome or periodic limb movement disorder |
| Numbness, tingling and "electric" pain, with secondary cramps; unrelated to sleep or exercise | Peripheral neuropathy |
| Cramps accompanied by metabolic signs or symptoms | Kidney failure |
| Cramps accompanied by jaundice, weight loss, weakness or signs of alcohol misuse | Cirrhosis of the liver |

 For further information on restless leg syndrome, see "Managing Restless Legs Syndrome in Adults", Page 18

Lifestyle interventions: diet, exercise and stretching

Encourage sufficient fluid intake during the day and avoidance of caffeine and alcohol, particularly later in the day.¹

There is mixed evidence as to whether brief stretching prior to sleep is beneficial, however it can be trialled. A randomised controlled trial, found that the frequency of nocturnal leg cramps decreased significantly after six weeks in participants who performed brief stretching before bed each night.⁴ However, a limitation of this study was that the control group did not receive a placebo intervention. In another study where the control group performed sham exercises, calf-stretching was not shown to be effective in reducing the frequency or severity of night cramps.⁵

Brief light exercise, such as walking or cycling on a stationary bike prior to bed time can be trialled, although evidence of significant benefit is also lacking.¹

Pharmacological interventions and supplements

Mineral and vitamin supplements are unlikely to be beneficial for most people. Magnesium supplementation has no benefit in the treatment of nocturnal cramps,⁶ although there is conflicting evidence that it may reduce nocturnal cramps in women who are pregnant.² Supplementation with both vitamin E and calcium has been found to be no more effective than placebo in reducing leg cramps.⁷

Over-the-counter “anti-cramp” formulations, such as Crampeze, contain some variation or combination of calcium, magnesium, high-dose vitamin B6 or B12 and associated supplements. There is no evidence of benefit for these preparations, although there is anecdotal evidence that they may be helpful for some people.

There is limited evidence that nortriptyline, diltiazem, orphenadrine, verapamil or gabapentin (not subsidised) may be effective for night cramps, and can be considered in patients with severe symptoms.^{1,6} Despite good evidence that quinine is effective for the treatment of nocturnal cramps it is no longer recommended due to safety concerns.

If medicines are used, they should be initiated at the lowest possible dose and discontinued if no obvious benefit is observed.

Quinine is not recommended as treatment

Quinine has traditionally been used at a low dose (200 – 300 mg/day) for nocturnal leg cramps, and is effective at reducing the frequency and severity of cramps.⁸ However, it is no longer recommended for nocturnal leg cramps due to concerns over its safety. In 2007, Medsafe issued a warning that the risk-benefit ratio of quinine for leg cramps no longer supported its use, and manufacturers were required to remove leg cramps as an indication for quinine.^{9,10}

The main concern with quinine is the risk of potentially fatal thrombocytopenia. Quinine-related thrombocytopenia is thought to be due to an idiosyncratic hypersensitivity reaction, and therefore can occur unpredictably, either immediately or after years of treatment.⁸ Other hypersensitivity reactions associated with quinine include haemolytic uraemic syndrome, disseminated intravascular coagulation and acute kidney injury.⁸ Quinine is significantly toxic at high doses (causing cardiac arrhythmias, blindness and seizures), and has significant interactions with many other medicines.⁸ The frequency of serious adverse effects has been estimated to be 2% – 4%.¹¹

Quinine is also contained in tonic water, and some people use this as a remedy for nocturnal leg cramps. However, Medsafe has warned that even low doses of quinine, such as that found in 500 mL of tonic water, have been shown to cause severe thrombocytopenia.¹⁰

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