

# Will Tonic Water Stop My Eyelid Twitching?

This article was published in the following Dove Press journal:  
*Clinical Ophthalmology*

Majid Moshirfar<sup>1-3</sup>  
Shaan N Somani<sup>4</sup>  
Kathryn M Shmunis<sup>1</sup>  
Yasmyne C Ronquillo<sup>1</sup> 

<sup>1</sup>HDR Research Center, Hoopes Vision, Draper, UT, USA; <sup>2</sup>John A. Moran Eye Center, University of Utah School of Medicine, Salt Lake City, UT, USA; <sup>3</sup>Utah Lions Eye Bank, Murray, UT, USA; <sup>4</sup>Northwestern Feinberg School of Medicine, Chicago, IL 60611, USA

**Abstract:** Eyelid myokymia, commonly referred to as “eyelid twitching”, is a common, benign condition that resolves in most individuals within hours to days; however, chronic cases can persist for several weeks to months, prompting the search for home remedies that may reduce the frequency or duration of symptoms. In this article, we discuss the proposed pathophysiologic mechanism and safety concerns surrounding tonic water as a treatment for eyelid myokymia.

**Keywords:** myokymia, quinine, tonic water, eyelid twitching

Eyelid myokymia, also known as “eyelid twitching”, refers to the involuntary, rhythmic, fascicular contraction of the orbicularis oculi muscle, most often presenting unilaterally in the lower eyelid.<sup>1</sup> Though rarely secondary to multiple sclerosis, cerebral tumors, or drug toxicity, eyelid myokymia is generally a benign condition that resolves without pharmacologic treatment.<sup>2-4</sup> The etiology of eyelid myokymia remains incompletely understood, but it has been associated with stress, anxiety, fatigue, and excess caffeine consumption – in other words, the components of a typical workday.<sup>5</sup> Eyelid myokymia almost always subsides within a matter of hours to days with rest and stress removal; however, chronic cases can persist for several weeks to months and serve as a nuisance to patients. Risk factors for the development of chronic eyelid myokymia include female gender and cold weather.<sup>6</sup> Chronic eyelid myokymia has been treated successfully with botulinum toxin in the United States of America.<sup>7</sup> Several potential treatments for chronic eyelid myokymia have been proposed such as calcium, folic acid, phosphorus, potassium, and various vitamins;<sup>7</sup> to date, no clinical trials have been conducted to investigate the efficacy of these supplements in reducing the frequency or duration of eyelid twitching.

Tonic water is one such treatment that has been touted anecdotally as beneficial for patients with persistent eyelid twitching. The hypothesized therapeutic mechanism of tonic water stems from one of its flavoring ingredients, quinine, an antimalarial that has demonstrated utility in the treatment of nocturnal leg cramps. Quinine is believed to exert this effect through the non-competitive inhibition of acetylcholine receptors at the neuromuscular junction.<sup>8</sup> A 2015 systematic review indicated that quinine at 200–500 mg daily may result in a significant reduction in cramp frequency and intensity.<sup>9</sup> For reference, the US Food and Drug Administration has indicated that food and beverage products may contain at most 83 parts per million of quinine; this translates to at most 83 mg of quinine in a one-liter bottle of tonic water.<sup>10</sup>

Of note, the off-label use of quinine for muscle cramps has been warned against by the US Food and Drug Administration (FDA) due to the risk of severe adverse outcomes. Namely, quinine overdose may result in cinchonism, a condition characterized by hearing loss, tinnitus, tremors, and ataxia; this complication is believed to

Correspondence: Majid Moshirfar  
HDR Research Center, Hoopes Vision,  
11820 S. State Street Suite #200, Draper,  
UT 84020, USA  
Tel +1 801-568-0200  
Email Cornea2020@me.com

be secondary to the toxic effects of quinine on dopaminergic neurons in the central nervous system.<sup>11</sup> Other quinine-induced complications that have been described include hemolytic-uremic syndrome, thrombocytopenia, blindness, hypotension, convulsions, and cardiac arrhythmias.<sup>12–14</sup> Transient visual obscurations may occur in doses as small as 130 mg (the amount of quinine contained in approximately seven glasses of gin and tonic).<sup>12</sup> At sufficiently high levels, quinine may inhibit CYP2D6, thereby interacting with various antidepressants, antacids, statins, blood thinners, antibiotics, seizure medications, and neuromuscular-blocking drugs.<sup>15,16</sup> Therefore, quinine at therapeutic dosage should be avoided by patients with abnormal heart rhythms, myasthenia gravis, optic neuritis, liver disease, or kidney disease, as well as women who are pregnant or breastfeeding.<sup>16</sup> Following these warnings by the FDA, the use of quinine for treatment of muscle cramps decreased by 99% between 2006 and 2012.<sup>17</sup>

The potential use of quinine in the treatment of eyelid myokymia must be weighed against the known risk for toxicity. Various online resources swear by the anecdotal benefits of tonic water in providing relief of chronic eyelid twitching.<sup>18,19</sup> However, the improvement of the symptoms may not be attributable to tonic water alone given the self-limiting nature of the condition. It is unlikely that clinical trials will be performed to evaluate the efficacy and safety of quinine in eyelid myokymia due to the benign nature of the disease. While the amount of quinine obtained through moderate intake of tonic water is not likely to affect patients with the aforementioned medical conditions, the frequency and total volume of tonic water intake is an important consideration in these cases.<sup>15</sup> For most patients, physicians should feel comfortable recommending a short trial of one to two glasses of tonic water daily for a few days without concern for significant harm; nonetheless, obtaining a thorough medical history is essential to identify patients to whom the risk for serious adverse outcomes associated with larger doses of tonic water must be conveyed.

## Author Contributions

All named authors meet the International Committee of Medical Journal Editors (ICMJE) criteria for authorship for this manuscript, take responsibility for the integrity of the work, and have given final approval to the version to be published. All authors contributed to data analysis, drafting and revising the article, gave final approval of the version to be published, and agree to be accountable for all aspects of the work.

## Funding

This study was funded by an unrestricted grant from Research to Prevent Blindness (RPB), 360 Lexington Avenue, 22nd Floor New York, NY 10017. No support was received for the publication of this article.

## Disclosure

None of the authors have a conflict of interest related to this work.

## References

- Givner I, Jaffe NS. Myokymia of the eyelids\*. *Am J Ophthalmol*. 1949;32:51–55. doi:10.1016/0002-9394(49)91107-1
- Hertz R, Espinosa J, Lucerna A, Stranges D. Multiple sclerosis presenting with facial twitching (Myokymia and Hemifacial Spasms). *Case Rep Neurol Med*. 2017. doi:10.1155/2017/7180560
- Kitaguchi Y, Sabundayo MS, Kakizaki H. Eyelid myokymia with concomitant cerebral tumour: a case report. *Neuro-Ophthalmology*. 2018;42(3):150–152. doi:10.1080/01658107.2017.1350195
- Medrano-martinez V, Pérez-sempere A, Moltó-jordá JM, et al. Eyelid myokymia in patients with migraine taking topiramate. *Acta Neurol Scand*. 2015;132(2):143–146. doi:10.1111/ane.12395
- Khalkhali M. Topiramate-induced persistent eyelid myokymia. *Case Rep Psychiatry*. 2016;2016:1–3. doi:10.1155/2016/7901085
- Lee SY, Lai SC. Clinical and electrophysiological analysis of chronic eyelid twitching. *Acta Neurol Taiwan*. 2017;26(4):177–183.
- Banik R, Miller NR. Chronic myokymia limited to the eyelid is a benign condition. *J Neuro-Ophthalmol*. 2004;24(4):290–292. doi:10.1097/00041327-200412000-00003
- Gisselmann G, Alisch D, Welbers-joop B, Hatt H. Effects of quinine, quinidine and chloroquine on human muscle nicotinic acetylcholine receptors. *Front Pharmacol*. 2018;9:1–7. doi:10.3389/fphar.2018.01339
- El-tawil S, Al Musa T, Valli H, et al. Quinine for muscle cramps. *Cochrane Database Syst Rev*. 2015;2015(4). doi:10.1002/14651858.CD005044.pub3
- CFR. Code of federal regulations title 21 volume 3 section 172.575; April 1, 2019. Available from: <https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/CFRSearch.cfm?fr=172.575>. Accessed October 3, 2019.
- Zou L, Xue Y, Jones M, Heinbockel T, Ying M, Zhan X. The effects of quinine on neurophysiological properties of dopaminergic neurons. *Neurotox Res*. 2018;34(1):62–73. doi:10.1007/s12640-017-9855-1
- Prasad RS, Kodali VRR, Khurajam GS, Cho M, Travers JP. Acute confusion and blindness from quinine toxicity. *Eur J Emerg Med*. 2003;10(4):353–356. doi:10.1097/00063110-200312000-00025
- Crum NF, Gable P. Quinine-induced hemolytic-uremic syndrome. *South Med J*. 2000;93(7):726–728. doi:10.1097/00007611-200093070-00021
- Samaranayake CB, Yap E. Fatal quinine-induced thrombocytopenia from pulmonary haemorrhage. *Intern Med J*. 2014;44(4):423–425. doi:10.1111/imj.12393
- Donovan JL, DeVane CL, Boulton D, Dodd S, Markowitz JS. Dietary levels of quinine in tonic water do not inhibit CYP2D6 in vivo. *Food Chem Toxicol*. 2003;41:1199–1201. doi:10.1016/S0278-6915(03)00112-1
- Brasić JR. Should people with nocturnal leg cramps drink tonic water and bitter lemon? *Psychol Rep*. 1999;84(2):355–367. doi:10.2466/pr0.1999.84.2.355
- Houstoun M, Reichman ME, Graham DJ, et al. Quinine sulfate use and hematologic adverse events: active surveillance in medicare. *Pharmacoepidemiol Drug Saf*. 2013;22.

18. Leaman E. How I finally (Finally!) got my eye to stop twitching. Philadelphia Magazine website; October 10, 2013. Available from: <https://www.phillymag.com/be-well-philly/2013/10/10/finally-finally-eye-stop-twitching-2/>. Accessed October 18, 2019.
19. Paniccia S Eyelid twitching/myokymia and tonic water. Optometry Students website; September 25, 2011. Available from: <https://www.optometrystudents.com/pearl/eyelid-twitchingmyokymia-and-tonic-water/>. Accessed October 18, 2019.

## Clinical Ophthalmology

Dovepress

### Publish your work in this journal

Clinical Ophthalmology is an international, peer-reviewed journal covering all subspecialties within ophthalmology. Key topics include: Optometry; Visual science; Pharmacology and drug therapy in eye diseases; Basic Sciences; Primary and Secondary eye care; Patient Safety and Quality of Care Improvements. This journal is indexed on PubMed

Central and CAS, and is the official journal of The Society of Clinical Ophthalmology (SCO). The manuscript management system is completely online and includes a very quick and fair peer-review system, which is all easy to use. Visit <http://www.dovepress.com/testimonials.php> to read real quotes from published authors.

Submit your manuscript here: <https://www.dovepress.com/clinical-ophthalmology-journal>