

Presumptive spondylogenic pruritus: a case study

Leonard J. Faye, DC¹
Brian S. Budgell, DC, PhD²

Objective: *To describe a case of a patient with chronic pruritus of the upper back and arms who underwent complete resolution of his complaint following a short course of chiropractic care.*

Case Presentation: *A 36-year-old male suffering with chronic, severe pruritus affecting the upper back and both arms, presented for chiropractic treatment after pharmacological treatment and dietary restrictions failed to resolve his complaint. Physical examination revealed restrictions of thoracic and cervical intervertebral motion. However, radiological examination did not identify any substantial pathology of the spine. Following a short course of chiropractic treatment, which included spinal manipulation and home exercises, his complaint of pruritus resolved completely.*

Summary: *In this case, a severe and chronic complaint of pruritus which was refractory to other forms of care resolved quickly after the institution of chiropractic care. It is therefore hypothesized that the patient's pruritus was etiologically linked to biomechanical problems of the spine.*

(JCCA. 2020;64(2):139-143)

KEY WORDS: case report, pruritus, notalgia paresthetica, chiropractic, spinal manipulation

Objectif : *Décrire le cas d'un patient présentant un prurit chronique à la partie supérieure du haut du dos et aux bras qui est complètement disparu après une courte période de traitements chiropratiques.*

Exposé du cas : *Un homme de 36 ans souffrant d'un prurit chronique grave à la partie supérieure du dos et aux deux bras s'est présenté à une clinique chiropratique après avoir suivi un traitement pharmacologique et un régime alimentaire qui se sont avérés infructueux. L'examen physique a révélé une limitation de la mobilité articulaire de la colonne dorsale et de la colonne cervicale. L'examen radiologique n'a révélé aucune pathologie grave de la colonne vertébrale. Après une brève période de séances chiropratiques par manipulations vertébrales et un programme d'exercices à domicile, le prurit est complètement disparu.*

Résumé : *Dans ce cas, un prurit grave et chronique, réfractaire à d'autres formes de traitement, est disparu rapidement après le commencement des traitements chiropratiques. On peut donc supposer que le prurit du patient était lié à des troubles biomécaniques de la colonne vertébrale.*

(JCCA. 2020;64(2):139-143)

MOTS CLÉS : compte rendu de cas, prurit, notalgie paresthésique, chiropratique, manipulation Vertébrale

¹ Private practice, Los Angeles, CA

² Canadian Memorial Chiropractic College, Toronto, ON

Corresponding Author: Leonard J. Faye, 10801 National Blvd Ste. 340, Los Angeles, CA 90064, USA

E-mail: LJFaye@gmail.com

© JCCA 2020

The authors have no disclaimers, competing interests, or sources of support or funding to report in the preparation of this manuscript. The involved patient provided consent for case publication.

Introduction

Pruritus is a troubling symptom of a variety of diseases, with the prevalence of atopic dermatitis alone estimated at 230 million cases worldwide.¹ Pruritus is a noxious, non-painful cutaneous sensation which, when initiated peripherally, is transmitted via a sub-class of primary afferent neurons with small diameter axons to the central nervous system, and provokes scratching behaviour. The peripheral pruriceptor uses gastrin releasing peptide (GRP) to signal secondary neurons in the superficial dorsal horn.² While itching motivates scratching as a programmed response, a number of innocuous physical (non-pharmacological) modalities have also shown at least transient effects against pruritus^{3,4} and it has been hypothesized that some of these effects may be mediated via peripheral TRP (transient receptor potential) receptors⁵. Transmission in the dorsal horn is inhibited by GABA (gamma aminobutyric acid) and glycine released by primary nociceptors in response, for example, to scratching or heat stimulation^{6,7}, indicating that the response to and inhibition of itching can be modulated by the spinal cord.

Pruritus is a common and troubling complaint, which often defies effective management.¹ This report describes the case of a patient who had failed to find relief with conventional medical management, but experienced rapid relief of pruritus following initiation of chiropractic care. The authors hypothesize that the patient's pruritus was related etiologically to biomechanical dysfunction of the spine.

Concerning this hypothesis, 11 previously published case reports contained specific information on the site of pruritus and the site of the spinal segment or nerve root which was implicated.^{3,8-16} All 11 case reports involved female patients across the age range from 19 months to 74 years. In fact, the specific syndrome of brachioradial pruritus has been noted to be more prevalent in Caucasians and in females.¹⁷ The duration of pruritus in the studies cited above ranged from 6 months to 10 years. As expected with case reports, all patients experienced improvement or complete resolution of their complaint following treatment, including those patients who underwent surgical interventions.^{13,16} With spinal traction or manipulation, improvement or resolution was achieved with up to 2.5 months of treatment. In seven of 11 cases, the pruritus was confined to the upper back, shoulder or arm, and in each of these cases there was a history of spin-

al complaints in the neck or upper back.^{8,9,12,13,15,16,18} One case of perineal/perianal pruritus was associated with an L4-5 disc herniation.¹¹ One case affecting the upper and lower limbs, and one case involving the pelvis and thighs were both associated with dyskinesia of the thoracic spine and were treated with spinal manipulation.^{10,14} In one case, there was not a clear topographical relationship between the site of pruritus (lower thoracic) and the known spinal lesion (prior cervical disc surgery).³ Thus, it does appear that frank impingement of the spinal cord or spinal nerves may be associated, etiologically or otherwise, with pruritus. In the majority of cases reported herein, there was a clear topographical association between the site of pruritus and a known spinal lesion. Others have reported similar cases¹⁹, including cases where the pruritus resolved after surgical removal of spinal tumors²⁰.

Case Presentation

A 36-year-old male presented to his chiropractor complaining of chronic, severe pruritus affecting the torso, specifically the upper back, and both arms between the shoulders and the wrists. He was a smoker of less than a pack a day and he drank no alcohol. He was of mesomorphic build at 5 foot 8 inches (1.73 m) and 160 pounds (72.6 kg). Initially, he experienced pruritus across his back, but after three years the complaint spread to his arms. He was unaware of any initiating event or aggravating factors. The itching on his arms was so severe that he scratched through the skin and produced bleeding sores. The itching also prevented him from sleeping well at night, although the intensity of nocturnal itching, and so sleep disturbance, were variable. He had consulted several general physicians who advised him that he was suffering from allergies, and variously prescribed an anti-histamine, sleeping pills and moisturizing cream. At different times, he was put on gluten-free, dairy-free, and hot pepper-free diets, along with a five-day fast and a rotation diet, none of which helped him scratch less or sleep better. Once he began scratching his arms, he could not stop even after he caused bleeding. He was aware that his spine was unusually stiff, but could not recall when or how he first became aware of this, and he thought his discomfort contributed to his poor sleep.

Clinical findings

His upper extremity deep tendon reflexes were normal and



Figure 1.

Patient exercise: with elbows flexed and arms abducted and extended at shoulders, from left to right the patient (i) protracts the head, (ii) retracts the head, (iii) extends the neck to look up at the ceiling.

there were no abnormal sensory findings. He was so stiff that anterior-posterior and lateral x-rays of the cervical, thoracic and lumbar spine were ordered to rule out possible pathologies, such as ankylosing spondylitis, before completion of his physical examination. He was referred to an imaging center and the radiologist reported the following: 1) minimal dextrocurvature of the mid-thoracic spine without significant degenerative changes, 2) mild narrowing of the L1-L2 disc space with no additional manifestation of degenerative disc findings present, 3) mild straightening of the normal cervical curve with minimal degenerative changes seen at C4-C5 and C5-C6 with minimal anterior disc calcification. Soft tissues were unremarkable.

Seated motion palpation, a form of physical examination routinely employed in chiropractic, revealed restriction from T5 to T7, and stressing into the restriction produced widespread diaphoresis. His cervical ranges of motion were reduced substantially in all planes.

Therapeutic interventions and outcome:

The patient was advised that his pruritus might be due to or facilitated by disturbed spinal mechanics and that a trial course of chiropractic management involving spinal manipulation should be undertaken. The patient was treated ten times at weekly intervals due to travel constraints. He received chiropractic high-velocity, low-amplitude (HVLA) manipulations in the upper cervical region in both posterior to anterior (contact over the dorsal aspect

of the articular pillars) and anterior to posterior (contact over the scalene muscles and ventral aspect of the articular pillars) directions. The diaphoretic reaction occurred for the first few visits. The upper thoracic region was also manipulated to increase the anterior glide of the vertebral and costo-transverse joints at T7 and above. By the fifth visit, his cervical spine was moving normally in all directions, however his thoracic spine was still not extending and gliding forward normally. The chiropractor applied moist hydroculator heat for 15 minutes before upper thoracic manipulation. On the sixth visit the patient was prescribed stretching exercises. He was shown how to raise his elbows to 90 degrees laterally (shoulder abduction) and then move his arms into extension to encourage anterior glide of the thoracic vertebra. Holding this position, he then had to protract his neck, retract his neck and then look up to the ceiling (Figure 1). He was to do this once every hour.

By the seventh visit his arms were healed, with no open sores or bleeding, and he was sleeping well without medication. He was treated twice more to continue reducing the upper thoracic restrictions and then he was discharged.

Discussion

The attribution of dermatomally distributed pruritus to spinal cord or spinal nerve root impingement does not appear to be controversial when a frank pathology is evident. Is it possible, however, that spondylogenic pruritus

could be triggered by relatively trivial anatomical changes in the vertebral column or by purely biomechanical changes as seen in this case? The distinction between structural and functional (biomechanical) disorders of the spine is, to a degree, arbitrary as illustrated by lumbar stenosis. While the term stenosis conjures the image of compression of neural structures, perhaps by a herniated disc or bony abnormality, posture and spinal movement have substantial effects on symptomatology. Could it therefore also be that a latent neurogenic pruritus could be brought to clinical threshold by the sorts of biomechanical changes which chiropractors variously term subluxation, restriction or fixation? In this regard, Heyl (1983) presented a series of 14 cases of brachioradial pruritus in which topical anti-pruritics were ineffective.²¹ Five of the patients received x-ray examination of the neck, and of these four showed evidence of degenerative disease. Three of these patients underwent physical treatments – cervical traction, spinal manipulation or physiotherapy of the neck with substantial improvement in symptoms. In a cohort of 41 patients with brachioradial pruritus, Marziniak *et al.* (2010) reported that 80.5% showed imaging evidence of stenosis of the intervertebral foramen or protrusions of the cervical disc, and that the locations of the anatomical lesions corresponded to the dermatomes affected by pruritus.²² They concluded that brachioradial pruritus may be provoked by subtle nerve compression which need not be accompanied by neck pain. Tait *et al.* (1998) reported on 14 patients with brachioradial pruritus who underwent cervical spinal manipulation.²³ The six patients who reported previous complaints in the cervical spine all experienced resolution of their pruritus, as did four of the eight patients who did not have a prior history of cervical spinal pain or injury. Collectively, these studies suggested that biomechanical treatments of the spine have the potential to relieve neurogenic pruritus where gross anatomical abnormalities of the spine are absent.

This report describes a patient with severe and longstanding pruritus of the upper back and arms, who experienced complete relief of his complaint coincident with receiving chiropractic care. A small number of reports have previously linked resolution of chronic pruritus to spinal manipulative care. These include i) a case of a 37 year-old female who suffered with bilateral brachioradial pruritus for nine months, recovering after 2.5 months of care involving upper cervical spinal manipulation¹⁸, ii) a

34 year-old female with a two year history of daily upper and lower limb itching relieved after four treatments incorporating spinal manipulation¹⁴, and iii) a 59 year-old woman with chronic left scapular pruritus who experienced substantial relief of her symptoms following a single osteopathic manipulative treatment⁹. An advantage of spinal manipulative care is that serious adverse events are relatively uncommon^{24,25} and compliance is immediately obvious to the clinician – the patient either does or does not attend their treatment session.

While it is not within the scope of this paper to defend a specific hypothetical mechanism at the molecular or cellular level, it has been suggested that neurogenic pruritus in general and notalgia paresthetica and brachioradial pruritus in particular, are in some cases caused by physical impingement of a peripheral nerve.²⁶ In this regard, readers will see a parallel in neuropathic pain, and recall that both pruritic and nociceptive sensation are transmitted by small diameter, unmyelinated axons. Hence, in broad strokes, the mechanism(s) of neuropathic pain in nociceptor axons may well be the mechanism(s) of neuropathic pruritus in pruritic axons.

Summary

While a single case report does not provide strong evidence of causality, in the present case and a number of other studies, the temporality of events is quite convincing.^{9,14,18} In each case, a condition which was severe, chronic and refractory to other treatments resolved quickly when the novel treatment, spinal manipulation, was introduced. On the other hand, the small number of similar cases, and the lack of specificity – apparently many people with biomechanical problems of the spine do not complain of pruritus – argue against a cause-effect relationship between biomechanical problems of the spine and pruritus. Thus, in this case, we are left to wonder whether the patient's vertebral complaints led to pruritus, and whether spinal manipulation was the principal cause of relief. Notwithstanding the limited evidence in favour of a distinct entity of spondylogenic pruritus, practitioners may wish to consider the possibility when confronted with a pruritic patient with biomechanical problems of the spine and no other apparent etiology for their pruritus.

References:

1. Tsai TF, Rajagopalan M, Chu CY, et al. Burden of atopic dermatitis in Asia. *J Dermatol*. 2019;46(10): 825-834.
2. Sun YG, Chen ZF. A gastrin-releasing peptide receptor mediates the itch sensation in the spinal cord. *Nature*. 2007;448(9): 700-704.
3. Ricciardo B, Kumar S, O'Callaghan J, Boyce Z. Peripheral nerve field stimulation for pruritus relief in a patient with notalgia paraesthetica. *Australas J Dermatol*. 2010;51: 56-59.
4. Stellan A. Neurogenic pruritus: an unrecognized problem? A retrospective case series of treatment by acupuncture. *Acupunct Med*. 2016;20(4): 186-190.
5. Lucaciu OC, Connell GP. Itch sensation through transient receptor potential channels: a systematic review and relevance to manual therapy. *J Manipulative Physiol Ther*. 2013;36: 385-393.
6. Akiyama T, Carstens MI, Carstens E. Transmitters and pathways mediating inhibition of spinal itch-signaling neurons by scratching and other counterstimuli. *PLoS One*. 2011;6(7): e22665.
7. Chuquilin M, Alghalith Y, Fernandez KH. Neurocutaneous disease; cutaneous neuroanatomy and mechanisms of itch and pain. *J Am Acad Dermatol*. 2016;74:197-212.
8. Alai NN, Skinner HB, Nabili ST, Jeffes E, Shahrokni S, Saemi AM. Notalgia paresthetica associated with cervical spinal stenosis and cervicothoracic disk disease at C4 through C7. *Cutis*. 2010;85(2): 77-81.
9. Richardson BS, Way BV, Speece AJ. Osteopathic manipulative treatment in the management of notalgia paresthetica. *J Am Osteopath Assoc*. 2009;109(11): 605-608.
10. Eldred DC, Tuchin PJ. Treatment of acute atopic eczema by chiropractic care. *Austral J Chiro Osteopath*. 1999;8(3): 96-101.
11. LaBan MM, Weinerman Z. Urogenital pruritus in association with lumbar spinal stenosis. *Am J Phys Med Rehab*. 2015;94(2): e19.
12. Carvalho S, Alves R. Brachioradial pruritus in a patient with cervical disc herniation and Parsonage-Turner syndrome. *As Bras Dermatol*. 2015;90(3): 401-402.
13. Binder A, Folster-Holst R, Sahan G, et al. A case of neuropathic brachioradial pruritus caused by cervical disc herniation. *Nature Clin Pract Neurol*. 2008;4(6): 338-342.
14. Hochman J. Chiropractic intervention for pruritus: a case study. *J Chiropr Educ*. 2009;23(1):109.
15. Low R, Swanson LA, Swanson DL. Notalgia paresthetica relieved by cervical traction. *J Am Board Fam Med*. 2017;30: 835-837.
16. Soltani-Arabshahi R, Vanderhooft S, Hansen D. Intractable localized pruritus as the sole manifestation of intramedullary tumor in a child. *JAMA Dermatol*. 2013;149(4): 446-449.
17. Pinto AC, Wachholz PA, Masuda PY, Martelli AC. Clinical, epidemiological and therapeutic profile of patients with brachioradial pruritus in a reference service in dermatology. *An Bras Dermatol*. 2016;91(4): 549-551.
18. Davis WR, Basillio RF. Resolution of brachioradial pruritus, vertigo and neck pain following introduction of upper cervical chiropractic care: a case study. *J Upper Cerv Chiropr Res*. 2011;April 18, 2011:22-24.
19. Grob JJ, Bonerandi JJ. Dermatomal pruritus of the upper limb: a manifestation of nerve root compression due to degenerative spine disease? *J Dermatology*. 1987;14: 512-513.
20. Wolking S, Lerche H, M. D. Episodic itch in a case of spinal glioma. *BMC Neurol*. 2013;13:124.
21. Heyl T. Brachioradial pruritus. *Arch Dermatol*. 1983;119: 115-116.
22. Marziniak M, Phan NQ, Raap U, et al. Brachioradial pruritus as a result of cervical spine pathology: the results of a magnetic resonance tomography study. *J Am Acad Dermatol*. 2011;65: 756-762.
23. Tait CP, Grigg E, Quirk CJ. Brachioradial pruritus and cervical spine manipulation. *Austral J Dermatol*. 1998;39: 168-170.
24. Paanalahti K, Holm Lw, Mordin M, Asker M, Lyander J, Skillgate E. Adverse events after manual therapy among patients seeking care for neck and/or back pain; a randomized controlled trial. *BMC Musculoskelet Disord*. 2014;15.
25. Paige NM, Miake-Lye IM, Booth MS, et al. Association of spinal manipulative therapy with clinical benefit and harm for acute low back pain: systematic review and meta-analysis. *JAMA*. 2017;317(14): 1451-1460.
26. Muir B. Dorsal scapular nerve neuropathy: a narrative review of the literature. *J Can Chiropr Assoc*. 2017;61(2): 128-144.