

Brachioradial Pruritus

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OVERVIEW

Background

Brachioradial pruritus is a neurogenic itch syndrome of the upper extremities. It is typically localized to the skin on the dorsolateral forearm overlying the proximal head of the brachioradialis muscle, but involvement of the upper arms and shoulders is also common. [1, 2] It may be unilateral or bilateral. Scratching reportedly only makes the discomfort worse, and most patients discover that application of cold packs is often the only therapy that provides symptomatic relief. [3] Brachioradial pruritus was first described in Florida in 1968 by Waisman [4] and has since been reported from subtropical areas such as South Africa [1] and Hawaii. [5] It is seen less frequently, but still with regularity, in temperate climates.

Pathophysiology

The condition appears to represent a primary neuropathy. [6] Abnormalities in cutaneous innervation have been documented among patients with brachioradial pruritus. Massey and Massey [7] reported altered sensation to temperature and pinprick in the distribution of the posterior cutaneous nerve of the forearm, which supplies the skin over the brachioradialis muscle that is typically pruritic. Among patients with brachioradial pruritus, cold or heat hyperalgesia in the C5-C6 distribution [8] and pinprick hyperesthesia in the C5-C8 distribution [9, 10] have been reported.

Wallengren and Sundler [11] used neuronally directed antibodies to show that patients with brachioradial pruritus have reduced numbers of dermal and epidermal nerve fibers, and, moreover, that this reduction in cutaneous innervation only occurs during symptomatic flares. [12] De Ridder et al demonstrated selective C-fiber dysfunction at C6-8 using quantitative sensory testing in a patient with brachioradial pruritus, with improvement of C-fiber functionality after intralaminar C6-7 steroid injection. [13] Increased skin perfusion on the affected forearm as measured by Doppler imaging has also been reported. [10]

The pruritus experienced by patients with brachioradial pruritus is believed to be a variant of pain. [7] However, the anatomic location of the neural injury or irritation producing this pain is controversial. Two prevailing hypotheses are proposed. The first postulates that brachioradial pruritus is caused by injury to peripheral cutaneous nerves from sunlight exposure. The second suggests that nerves are damaged at the level of the cervical spine. Both mechanisms appear to be active in many patients.

Evidence supporting the solar hypothesis

Many patients with brachioradial pruritus have a history of chronic sun exposure. [2, 14, 15] Kestenbaum and Kalivas [16] postulated that histamine release from mast cells in response to chronic sun exposure

might play a pathophysiologic role; they reported a patient with brachioradial pruritus and an elevated serum histamine level.

In some cases, sun exposure has been reported to exacerbate symptoms and photoprotection has been reported to provide amelioration. [4, 17, 18, 19]

A photoallergic reaction to varenicline mimicking brachioradial pruritus has been reported in one patient. [20]

Patients typically only describe symptoms on the sun-exposed dorsal surface of the arms and shoulders. [2, 5]

Left-sided symptoms are more common than right-sided symptoms in the United States, which may be the result of cumulative sun exposure to the arm from driving. [5] In South Africa, where drivers sit on the right-hand side of cars, the distribution is more often on the right arm. [1]

Symptoms among patients living in temperate climates often remit in the late fall and recur in the summer. [2, 4] Patients living in tropical climates, where it is sunny year round, tend to report symptoms that are more stable. [5]

Biopsy of affected skin typically shows atrophy and signs of sun damage. [2, 8]

The reduction in epidermal and dermal nerve fibers seen in brachioradial pruritus patients is also seen after serial phototherapy. [8]

Challenges to the solar hypothesis

If the dorsal surfaces of the arms are affected because they are exposed to the sun, then why is the sun-exposed face unaffected?

Why does no lower extremity equivalent of brachioradial pruritus occur in people who wear shorts?

If brachioradial pruritus is a manifestation of sun-induced nerve damage, why are children, who are typically very sensitive to the sun, never affected?

Evidence supporting the cervicogenic hypothesis

Several authors have reported a higher prevalence of cervical spine disease (eg, arthritis, osteochondrosis, spondylolytic changes) among patients with brachioradial pruritus. [1, 8, 21, 22] Marziniak et al performed magnetic resonance tomography of the cervical spine in 41 patients with brachioradial pruritus. [23] Thirty-three of 41 of these patients had stenosis of the intervertebral foramen or protrusions of the cervical disk, leading to nerve compression.

Cervical disk herniation with compression of the C6 nerve root has been reported in association with brachioradial pruritus, with rapid resolution of symptoms after ventral C5-C6 discectomy, C5-C6 vertebral fusion, and C6 nerve root decompression. [10]

Treatment of cervical spine arthritis has been reported to provide relief in patients with brachioradial pruritus. [1, 24] Epidural cervical steroid injections at the C6-7 level were reported to lead to disappearance of itch in a patient with brachioradial pruritus. [13]

Cervical spine tumors, [25] cervical ribs, hypertrophic cervical transverse processes, [26] and cervical osteophytes [27] have all been reported in case series to cause upper extremity pruritus.

Electrophysiological studies on patients with brachioradial pruritus have shown bilateral delay of F responses of median and ulnar nerves. [28]

Criticisms of the cervicogenic hypothesis

Cervical spinal disease is generally a permanent disorder and, as such, should produce a continuous neuropathic itch, rather than relapsing and remitting symptoms.

Cervical nerve blocks have been reported to be unhelpful. This may suggest that the location of the lesion is either more central (dorsal horn) or more peripheral (sensory nerve endings in the arm).

Degenerative cervical spinal changes are found in 70% of asymptomatic women and 95% of asymptomatic men older than 65 years [29]; thus, without age-matched controls, implicating cervical spinal disease as the cause of brachioradial pruritus is erroneous. [30] In a large retrospective case series, symptoms of brachioradial pruritus were attributed to cervical spine abnormalities among only 25% of patients. [31]

Conventional electrophysiological testing may not be appropriate in investigating the pathophysiology of brachioradial pruritus because it measures conduction of myelinated fibers, while the afferent nerves that transmit itch are actually unmyelinated. [8]

Epidemiology

Frequency

United States

The prevalence of brachioradial pruritus is unknown. Brachioradial pruritus was initially described as a disease of the tropics; however, in more recent years, it has also been documented in temperate climates.

Brachioradial pruritus is typically sporadic, although an autosomal dominant inheritance pattern has been reported in one family, with 11 members across two generations experiencing symptoms. [14]

Brachioradial pruritus has been reported among patients in California, [9] Massachusetts, [3, 22] North Carolina, [7] Kansas, [16] Florida, [4] and Hawaii. [5]

International

Brachioradial pruritus has been described among patients in South Africa, [1] Ireland, [21] Sweden, [14] France, [32] Denmark, [2, 15] Belgium, [8] Turkey, [25, 30] Israel, [28] and Australia. [24]

Race

Brachioradial pruritus has been reported among patients with all skin types, but whites (Fitzpatrick skin types I-III) appear to be affected more often than darker-skinned individuals. [5]

Sex

Brachioradial pruritus was first reported among middle-aged male outdoor workers^[4]; however, more recently, cases have been widely documented among both men and women.^[2, 14, 22]

Age

The onset of symptoms in persons with brachioradial pruritus typically occurs in the fourth to sixth decades of life. The youngest patient reported to have symptoms is an 18-year-old woman whose mother, sister, and 2 aunts also had brachioradial pruritus.^[14]

Prognosis

Most patients with brachioradial pruritus have remissions, but a small percentage have chronic disease. Emotional or psychiatric factors likely play a role in prognosis.

Patient Education

Education regarding sun protection and avoidance of peak sunlight hours is worthwhile.

Clinical Presentation

References

1. Heyl T. Brachioradial pruritus. *Arch Dermatol*. 1983 Feb. 119(2):115-6. [Medline].
2. Veien NK, Hattel T, Laurberg G, Spaun E. Brachioradial pruritus. *J Am Acad Dermatol*. 2001 Apr. 44(4):704-5. [Medline].
3. Bernhard JD, Bordeaux JS. Medical pearl: the ice-pack sign in brachioradial pruritus. *J Am Acad Dermatol*. 2005 Jun. 52(6):1073. [Medline].
4. Waisman M. Solar pruritus of the elbows (brachioradial summer pruritus). *Arch Dermatol*. 1968 Nov. 98(5):481-5. [Medline].
5. Walcyk PJ, Elpern DJ. Brachioradial pruritus: a tropical dermopathy. *Br J Dermatol*. 1986 Aug. 115(2):177-80. [Medline].
6. Shumway NK, Cole E, Fernandez KH. Neurocutaneous disease: Neurocutaneous dysesthesias. *J Am Acad Dermatol*. 2016 Feb. 74 (2):215-28; quiz 229-30. [Medline].
7. Massey EW, Massey JM. Forearm neuropathy and pruritus. *South Med J*. 1986 Oct. 79(10):1259-60. [Medline].
8. Crevits L. Brachioradial pruritus--a peculiar neuropathic disorder. *Clin Neurol Neurosurg*. 2006 Dec. 108(8):803-5. [Medline].
9. Fisher DA. Brachioradial pruritus wanted: a sure cause (and cure) for brachioradial pruritus. *Int J Dermatol*. 1997 Nov. 36(11):817-8. [Medline].
10. Binder A, Folster-Holst R, Sahan G. et al. A case of neuropathic brachioradial pruritus caused by cervical disc herniation. *Nat Clin Pract Neurol*. June 2008. 4 (6):338-342. [Medline]. [Full Text].

11. Wallengren J, Sundler F. Brachioradial pruritus is associated with a reduction in cutaneous innervation that normalizes during the symptom-free remissions. *J Am Acad Dermatol*. 2005 Jan. 52(1):142-5. [Medline].
12. Wallengren J. Self-healing photo-neuropathy and cervical spinal arthrosis in four sisters with brachioradial pruritus. *J Brachial Plex Peripher Nerve Inj*. November 2009. 17; 4:21. [Medline]. [Full Text].
13. De Ridder D, Hans G, Pals P, Menovsky T. A C-fiber-mediated neuropathic brachioradial pruritus. *J Neurosurg*. October 2009. 1-4. [Medline]. [Full Text].
14. Wallengren J, Dahlbäck K. Familial brachioradial pruritus. *Br J Dermatol*. 2005 Nov. 153(5):1016-8. [Medline].
15. Bech-Thomsen N, Thomsen K. Solar pruritus. *Acta Derm Venereol*. 1995 Nov. 75(6):488-9. [Medline].
16. Kestenbaum T, Kalivas J. Solar pruritus. *Arch Dermatol*. 1979 Nov. 115(11):1368. [Medline].
17. Orton DI, Wakelin SH, George SA. Brachioradial photopruritus--a rare chronic photodermatosis in Europe. *Br J Dermatol*. 1996 Sep. 135(3):486-7. [Medline].
18. Armstrong DK, Bingham EA. Brachioradial pruritus--an uncommon photodermatosis presenting in a temperate climate. *Dermatology*. 1997. 195(4):414-5. [Medline].
19. Masuda PY, Martelli AC, Wachholz PA, Akumatsu HT, Martins AL, Silva NM. Brachioradial pruritus -- descriptive analysis of Brazilian case series. *J Dtsch Dermatol Ges*. 2013 Jun. 11(6):530-5. [Medline].
20. Zabludovska K, Anderson MD, Jemec GB. Photoallergic reactions to varenicline mimicking brachioradial pruritus. *J Am Acad Dermatol*. 2013 Sep. 69(3):484. [Medline].
21. Barry R, Rogers S. Brachioradial pruritus--an enigmatic entity. *Clin Exp Dermatol*. 2004 Nov. 29(6):637-8. [Medline].
22. Goodkin R, Wingard E, Bernhard JD. Brachioradial pruritus: cervical spine disease and neurogenic/neuropathic [corrected] pruritus. *J Am Acad Dermatol*. 2003 Apr. 48(4):521-4. [Medline].
23. Marziniak M, Phan NQ, Raap U, Siepmann D, Schürmeyer-Horst F, Pogatzki-Zahn E, et al. Brachioradial pruritus as a result of cervical spine pathology: the results of a magnetic resonance tomography study. *J Am Acad Dermatol*. 2011 Oct. 65(4):756-62. [Medline].
24. Tait CP, Grigg E, Quirk CJ. Brachioradial pruritus and cervical spine manipulation. *Australas J Dermatol*. 1998 Aug. 39(3):168-70. [Medline].
25. Kavak A, Dosoglu M. Can a spinal cord tumor cause brachioradial pruritus?. *J Am Acad Dermatol*. 2002 Mar. 46(3):437-40. [Medline].
26. Rongioletti F. Pruritus as presenting sign of cervical rib. *Lancet*. 1992 Jan 4. 339(8784):55. [Medline].
27. Lane JE, McKenzie JT, Spiegel J. Brachioradial pruritus: a case report and review of the literature. *Cutis*. January 2008. 81(1):37-40. [Medline].

28. Cohen AD, Masalha R, Medvedovsky E, Vardy DA. Brachioradial pruritus: a symptom of neuropathy. *J Am Acad Dermatol*. 2003 Jun. 48(6):825-8. [Medline].
29. Gore DR, Sepic SB, Gardner GM. Roentgenographic findings of the cervical spine in asymptomatic people. *Spine*. 1986 Jul-Aug. 11(6):521-4. [Medline].
30. Savk E, Savk SO. On brachioradial pruritus and notalgia paresthetica. *J Am Acad Dermatol*. 2004 May. 50(5):800-1. [Medline].
31. Mirzoyev SA, Davis MD. Brachioradial pruritus: Mayo Clinic experience over the past decade. *Br J Dermatol*. 2013 Nov. 169(5):1007-15. [Medline].
32. Kanitakis J. Brachioradial pruritus: report of a new case responding to gabapentin. *Eur J Dermatol*. 2006 May-Jun. 16(3):311-2. [Medline].
33. Kwatra SG, Stander S, Bernhard JD, Weisshaar E, Yosipovitch G. Brachioradial pruritus: a trigger for generalization of itch. *J Am Acad Dermatol*. 2013 May. 68(5):870-3. [Medline].
34. Wallengren J, Sundler F. Cutaneous field stimulation in the treatment of severe itch. *Arch Dermatol*. 2001 Oct. 137(10):1323-5. [Medline].
35. Stellon A. Neurogenic pruritus: an unrecognised problem? A retrospective case series of treatment by acupuncture. *Acupunct Med*. 2002 Dec. 20(4):186-90. [Medline].
36. Kavanagh GM, Tidman MJ. Botulinum A toxin and brachioradial pruritus. *Br J Dermatol*. 2012 May. 166(5):1147. [Medline].
37. Poterucha TJ, Murphy SL, Davis MD, Sandroni P, Rho RH, Warndahl RA, et al. Topical amitriptyline-ketamine for the treatment of brachioradial pruritus. *JAMA Dermatol*. 2013 Feb. 149(2):148-50. [Medline].
38. Ally MS, Gamba CS, Peng DH, Tang JY. The use of aprepitant in brachioradial pruritus. *JAMA Dermatol*. 2013 May. 149(5):627-8. [Medline].
39. Bernstein JE. Capsaicin and substance P. *Clin Dermatol*. 1991 Oct-Dec. 9(4):497-503. [Medline].
40. Goodless DR, Eaglstein WH. Brachioradial pruritus: treatment with topical capsaicin. *J Am Acad Dermatol*. 1993 Nov. 29(5 Pt 1):783-4. [Medline].
41. Knight TE, Hayashi T. Solar (brachioradial) pruritus--response to capsaicin cream. *Int J Dermatol*. 1994 Mar. 33(3):206-9. [Medline].
42. Zeidler C, Lüling H, Dieckhöfer A, Osada N, Schedel F, Steinke S, et al. Capsaicin 8% cutaneous patch: a promising treatment for brachioradial pruritus?. *Br J Dermatol*. 2015 Jun. 172 (6):1669-71. [Medline].

Media Gallery

- Area of pruritus demarcated in pen in a middle-aged woman with brachioradial pruritus. Macroscopically, no skin changes are visible.
- Subtle excoriations on the dorsal forearm of a middle-aged woman with brachioradial pruritus.

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