

Brachioradial Pruritus: A Follow-up of 76 Patients

Niels K. Veien and Grete Laurberg

The Dermatology Clinic, Vesterbro 99, DK-9000 Aalborg, Denmark. E-mail: veien@dadlnet.dk

Accepted August 25, 2010.

Brachioradial pruritus (BRP) has characteristic symptoms described by patients as itching with special characteristics such as tingling, burning and stinging. The characteristic locations are the dorsal aspects of the forearms and lateral aspects of the upper arms. There are few physical findings, and histological changes are sparse. Cervical spine disease and excessive sun exposure have been identified as possible causes of BRP (1–5).

Seasonal symptoms with onset in late summer and symptom-free winter months seen in temperate climates suggest cutaneous neuropathy induced by cumulative sun exposure. Wallengren (6) has shown that the density of sensitive nerve fibres in the skin is higher during periods with symptoms compared to periods without symptoms.

Arthrosis, shoulder trauma, cervical disc herniation and narrowing of foramina of the cervical spine, particularly between C₅–C₆, have repeatedly been seen in groups of patients with no mention of seasonal variation of symptoms of BRP (7–11). In one case, one-sided symptoms were seen in a patient with narrowing of cervical spine foramina on the same side (12). For some patients, cervical spine arthrosis, as well as sun exposure, appears to precipitate BRP (13).

We followed a cohort of patients with BRP who had been instructed to reduce exposure to sun and sunbed use with annual telephone questionnaires to determine the course of the dermatosis.

MATERIAL AND METHODS

In a private practice with 3 full-time dermatologists, 95 consecutive patients (12 men and 83 women) were diagnosed with BRP over a period of 11 years, from January 1997 to the end of 2007. Twenty-one of the patients had been included in a previous report (1). Inclusion criteria: the diagnosis of BRP was made on clinical grounds and based on the patients' description of itching, tingling, and/or a burning sensation on the skin on the lateral aspects of the upper arms (on the dorsal aspect of the forearms and/or on the shoulders).

Other causes of pruritus were excluded by clinical examination. Patients with pruritic dermatoses, including contact dermatitis, and pruritus similar to the type induced by insect bites, were excluded from the study.

At the initial examination, all patients were given instructions to limit sun exposure to lesional skin during the summer months and during travel to sunny climates. They were asked to avoid sunbeds and were given general instructions about protection against the sun. Specifically, clothing was recommended as the best sun protection. If that was not possible, a sunblock such as Anthelios XL 50+ was recommended for daily use during the summer months.

When possible, results of radiographic examination of the cervical spine were obtained.

The patients were asked for permission to conduct an annual telephone interview to inquire about current symptoms, the location and duration of symptoms, and severity compared to previous years.

At each follow-up, patients were asked whether or not symptoms had been present during the previous year. If symptoms had occurred, they were asked about the month of onset and the month when the symptoms subsided, the nature of the symptoms (itching, burning, tingling, stinging, a sensation of insects creeping on the skin), and their location (unilateral or bilateral), e.g. on the lateral side of the upper arm, the dorsal side of the forearm, the shoulders or elsewhere. They were asked if the symptoms were unchanged compared to previous years, had lessened in severity or subsided, or had worsened. They were asked whether or not they had used sun protection, what type of sun protection had been used, and about possible trips to sunny climates, as well as the use of sunbeds. Information was obtained about any treatment used and whether the treatment had improved the condition.

The interviews, conducted by a registered nurse, were carried out during February and March to inquire about symptoms during the previous summer season.

Non-parametric statistical methods were used to compare the results.

RESULTS

The patients ($n=95$) ranged in age from 31 to 84 years (median 55 years). Prior to diagnosis they had had symptoms for between a few months and more than 30 years (median 6 years).

Twelve patients had symptoms on the right side only and 4 on the left side only. The remaining 79 patients had more or less symmetrical symptoms on the dorsal aspect of the forearms, and/or on the lateral aspects of the upper arms. Eight patients had additional symptoms on the chest and 5 on the anterior aspects of the lower legs.

For 19 patients there was no seasonal variation in symptoms, or the patients stated that they had symptoms on and off all year round. Seventy-four patients had distinctly seasonal symptoms with onset for 6 in July, 15 in August, 27 in September, 9 in October and the remainder in November to February. For 2 patients information about possible seasonal variation was not available.

For most of the patients with seasonal variation the symptoms subsided during the autumn and winter. For 9 the symptoms faded in August–September, for 12 in October–November, for 21 in December, and for the remainder the symptoms had subsided by May.

The follow-up period varied from a few months to 10 years. We were unable to contact 4 patients for follow-up, and 15 had been followed for only one or two years at the time of this study. Nine men and 67 women, were followed for 3 years or longer. The median follow-up

period was 5 years after the diagnosis was made and 8 years after the onset of symptoms. The results are shown in Table I. At the time of the last interview, 50 patients were free of symptoms, the symptoms of 16 had improved, while 10 had experienced no change or a worsening of symptoms.

Forty-five of 63 patients (71%) with seasonal symptoms had no symptoms at the latest follow-up compared with 5 of 13 (38%) who had year-round symptoms ($p=0.02$, χ^2 test). Forty of 53 patients (75%) with seasonal symptoms who used sun protection were symptom free at follow-up compared with 4 of 12 (33%) with year-round symptoms who used sun protection ($p=0.005$).

None of the patients had received treatment elsewhere that had significantly relieved their symptoms.

Results of radiographic evaluation of the cervical spine were available for 36 patients. Ten of 29 (34%) with seasonal symptoms had radiological evidence of narrowing of intervertebral foramina, compared with 4 of 7 (57%) with year-round symptoms ($p=0.39$, Fisher's test).

For the 14 patients with narrowing of intervertebral foramina, the narrowing was typically at the C₅–C₆ level. In addition to the narrowing of foramina, most of these patients had arthrosis and/or disease of intervertebral discs with reduced height of the discs.

DISCUSSION

In patients with seasonal symptoms it is difficult to consider BRP a neuropathy related solely to cervical spine pathology. Wallengren & Dahlbäck (13) concluded that seasonal occurrence and symptom-free periods during the winter months indicate that sun exposure is a significant factor in the development of BRP. The symmetry of symptoms would also seem to contradict the assumption that pressure on nerves in the cervical area is the sole cause of symptoms (11, 14).

In the current study, there appeared to be two distinct groups of patients. Eighty percent of all patients had seasonal symptoms. Onset typically occurred in late summer, with symptoms persisting until the end of the

year. During the follow-up period, it was shown that sun protection helped to reduce symptoms, particularly among patients whose symptoms showed seasonal variation. This, too, indicates that there may be different aetiologies of BRP.

Cervical spine disease, possibly with chronic sun damage as an aggravating factor, may well be the cause of symptoms among the group of patients whose symptoms have no clear seasonal variation. In the current study, radiographic evidence showed that 57% of patients without seasonal variation of symptoms had abnormal radiographs showing narrowing of intervertebral foramina, compared with 34% of patients with seasonal variation of symptoms. More sophisticated imaging systems than traditional X-ray may be necessary to pick up discrete evidence of nerve compression.

Considering the ages of the patients in this study, it would not be surprising if patients with BRP had osteoarthritis or other age-related damage to the cervical spine.

The mechanism of sun-induced pruritus is not well described. The nature of the pruritus is different from histamine-induced pruritus, with additional symptoms including tingling, burning and stinging. In Waisman's original description of BRP (14), in addition to pruritus, burning was mentioned as a symptom with exacerbation in hot environments and improvement in cooler environments and indoors. Bernhard & Bordeaux (15) coined the term "ice-pack sign" to describe the relief most patients feel when lesional skin is cooled. Wallengren & Sundler (3) found a reduction of epidermal and dermal nerve fibres in patients with seasonal BRP during active disease compared with a control group. Normalisation was seen during symptom-free winter months. They speculate that photodamage causes nociceptors to fire spontaneously and that the nerve impulses could be amplified by nerve compression secondary to cervical spine disease.

We conclude that sun exposure is an important aetiological factor for the majority of patients with BRP who live in temperate climates, but that for a group of patients without seasonal variation of symptoms cervical spine pathology may be the cause of symptoms. Sun protection reduces the symptoms of BRP, in particular in patients with seasonal symptoms.

ACKNOWLEDGEMENT

Registered nurse Synnøve Jensen carried out the telephone interviews described in this study.

REFERENCES

1. Veien NK, Hattel T, Laurberg G, Spaun E. Brachioradial pruritus. *J Am Acad Dermatol* 2001; 44: 704–705.
2. Yosipovitch G, Samuel LS. Neuropathic and psychogenic itch. *Dermatol Ther* 2008; 21: 32–41.

Table I. Symptoms reported at the final follow-up of 76 patients with brachioradial pruritus followed for 3 years or longer.

	Sun protection		Total
	Yes	No	
Seasonal symptoms (n=63)			
Cleared	40	5	45
Improved	13	2	15
No change or worsened	0	3	3
Year-round symptoms (n=13)			
Cleared	4	1	5
Improved	1	0	1
No change or worsened	7	0	7

3. 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; 52: 142–145.
4. Cohen AD, Masaha R, Medvedovsky E, Vardy DA. Brachioradial pruritus: A symptom of neuropathy. *J Am Acad Dermatol* 2003; 48: 825–828.
5. Goodkin R, Wingard E, Bernhard JD. Brachioradial pruritus: Cervical spine disease and neurogenic/neuropathic pruritus. *J Am Acad Dermatol* 2003; 48: 521–524.
6. Wallengren J. Self-healing photo-neuropathy and cervical spinal arthrosis in four sisters with brachioradial pruritus. *J Brachial Plex Peripher Nerve Inj* 2009; 4: 21–23.
7. Mataix J, Silvestre JF, Climent JM, Pastor N, Lucas A. Brachioradial pruritus as a symptom of cervical radiculopathy. *Actas Dermosifiliogr* 2008; 99: 719–722.
8. Lane JE, McKenzie JT, Spiegel J. Brachioradial pruritus: A case report and review of the literature. *Cutis* 2008; 81: 37–40.
9. Crevits L. Brachioradial pruritus – a peculiar neuropathic disorder. *Clin Neurol Neurosurg* 2006; 108: 803–805.
10. Kavak A, Dosoglu M. Can a spinal cord tumor cause brachioradial pruritus? *J Am Acad Dermatol* 2002; 46: 437–440.
11. Binder A, Fölster-Holst R, Sahan G, Koroschetz J, Stengel M, Mehdorn HM, et al. A case of neuropathic brachioradial pruritus caused by cervical disc herniation. *Nat Clin Pract Neurol* 2008; 4: 338–342.
12. De Ridder D, Hans G, Pals P, Menovsky T. A C-fiber-mediated neuropathic brachioradial pruritus. *J Neurosurg* 2010; 113: 118–121.
13. Wallengren J, Dahlbäck K. Familial brachioradial pruritus. *Br J Dermatol* 2005; 153: 1016–1018.
14. Waisman M. Solar pruritus of the elbows (brachioradial summer pruritus). *Arch Derm* 1968; 98: 481–485.
15. Bernhard JD, Bordeaux JS. Medical pearl: The ice-pack sign in brachioradial pruritus. *J Am Acad Dermatol* 2005; 52: 1073.