Similarities between Neuropathic Pruritus Sites and Lichen Simplex Chronicus Sites

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ABSTRACT: **Background:** Localized itch of non-pruritoceptive origin is often neuropathic and may be referred to as neuropathic itch syndrome.

Objectives: To describe the results of nerve conduction studies in patients with anogenital pruritus, brachioradial pruritus and scalp dysesthesia, and compare these sites to typical sites of lichen simplex chronicus (LSC).

Methods: The study summarizes previously published data combined with unpublished data of patients with scalp dysesthesia. Nerve conduction studies included measurements of distal sensory and motor latency, conduction velocity and F-responses.

Results: A neuropathy was demonstrated in 29 of 36 patients with anogenital pruritus (80.5%), 8/14 with brachioradial pruritus (57.1%) and 4/9 with scalp dysesthesia (44.4%). The typical sites overlapped with some but not all LSC sites.

Conclusions: A considerable proportion of patients with brachioradial pruritus, anogenital pruritus and scalp dysesthesia have abnormal nerve conduction findings, suggesting a neuropathic origin. The skin sites overlap with some common LSC sites, suggesting that in some cases of LSC a local neuropathy could be a possible cause.

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KEY WORDS: neuropathic pruritus, lichen simplex chronicus (LSC), brachioradial pruritus, anogenital pruritus

Lichen simplex chronicus is a localized itch with circumscribed thickening (lichenification) of the overlying skin. Although LSC may be found on any body surface, the typical sites are forearms, the nuchal area, scrotum, and shins. Brachioradial pruritus is a localized itch involving the overlying areas of the brachioradial muscle, primarily affecting the dorsolateral aspects of the forearm. There is reasonable evidence to suggest that the underlying causes of many cases of brachioradial pruritus are a neuropathy that may be exacerbated by solar damage to the skin [1-5].

Anogenital pruritus is an itch localized to the anus, perianal and genital skin. Anogenital pruritus may be pruritoceptive, i.e., attributed to inflammatory dermatoses, infectious diseases such as fungal infections, or manifestations of an anorectal disease. When such a cause of anogenital pruritus cannot be found, the pruritus is often termed "idiopathic." In previous studies we demonstrated that brachioradial pruritus and anogenital pruritus may be attributed to a radiculoneuropathy in a substantial proportion of patients [6].

Scalp dysesthesia is chronic pain and/or pruritus of the scalp without other findings. Scalp symptoms can present as pain with or without pruritus, or as pruritus alone [7]. The literature on scalp dysesthesia is scarce, with most observations relating dysesthesia to an underlying psychopathological condition or a chronic pain syndrome. Following our previously published studies of brachioradial pruritus and anogenital pruritus, we performed nerve conduction studies in patients with scalp dysesthesia, demonstrating that scalp dysesthesia may also be attributed to radiculo-neuropathy.

In the current study, we refer to local itch syndromes, a common clinical problem that is somewhat neglected academically, summarize previous studies of neuropathic etiology in patients with brachioradial pruritus and anogenital pruritus, and present data on scalp dysesthesia, after excluding pruritoceptive (primary skin disease) causes.

PATIENTS AND METHODS

The institutional review board approved the study. Included were consecutive patients visiting the dermatological clinic of the largest health fund in Israel (Clalit Health Services) who presented with persistent brachioradial pruritus, anogenital pruritus, or scalp dysesthesia. All patients were examined by a dermatologist and a neurologist. Excluded from the study were patients with pruritoceptive findings such as eczema, contact dermatitis, psoriasis, or skin infections. Also excluded were patients with systemic diseases such as chronic renal failure.

LSC = lichen simplex chronicus

Signs of lichenification and prurigo lesions were not considered exclusion criteria because of their association with chronic itch.

Radiographs of the spine were performed in all patients. Electrophysiological nerve conduction studies were conducted, including the measurement of sensory and motor distal latency, conduction velocity and F-waves in the radial, brachial and ulnar nerve of each arm (brachioradial pruritus), the tibial and peroneal nerve of each leg (anogenital pruritus), and the occipital nerves (scalp dysesthesia). In some patients with a diagnosis of sensory or motor neuropathy, a complementary workup, if deemed clinically necessary, was performed to ascertain any additional underlying cause. This included laboratory tests (complete blood count, electrolytes, liver and kidney function tests, blood glucose, hormone panel including thyroid as well as serum levels of B12 and folate), or imaging procedures including computed tomography.

Statistical analysis was performed using SPSS software. Descriptive data included proportions for categorical data and means, median, range and standard deviations for continuous variables. Paired *t*-tests were used to compare means of continuous variables regarding clinical outcomes.

RESULTS

The study group comprised 88 patients: 21 females (23.9%) and 67 males (76.1%) with a mean age of 56.4 ± 12.8 years (range 24–82). Twenty-five patients had brachioradial pruritus (some patients had more than one neuropathic syndrome and not all agreed to all tests), of whom 10 had neck pain (40.0%). Nerve conduction studies and electromyography demonstrated abnormalities in 8 of 14 patients (57.1%). Fifty-four patients had anogenital pruritus, 43 of whom had back pain (79.6%). Nerve conduction studies and electromyography demonstrated abnormalities in 29 of 36 patients (80.6%).

Nine patients had scalp dysesthesia, 7 of whom had back pain (77.8%). Nerve conduction studies and electromyography demonstrated abnormalities in 3 of 4 patients (75.0%). Polyneuropathy was present in 1 patient (25.0%) and cervical radiculopathy was found in 2 patients (50.0%).

DISCUSSION

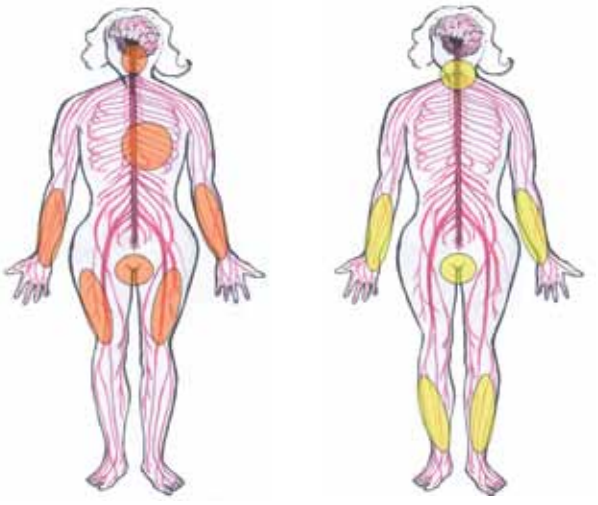
In the current study, three forms of localized itch were examined: anogenital pruritus, brachioradial pruritus, and scalp dysesthesia. It was observed that radiculopathy or polyneuropathy was present in a substantial proportion of the patients, suggesting a neuropathic origin in some of these forms of localized itch.

Pruritus is a somewhat orphan symptom since it was considered in the past as a subset of pain and elicited little research interest. While both pain and itch are induced by chemical messengers that excite unmyelinated C fibers, the current weight of evidence supports the view that a unique subpopulation of these fibers is activated by pruritus-inducing stimuli. Certain parts of the skin are highly sensitive to itch. Removing the nerve fibers in the immediate subdermal tissue of these anatomical sites will leave pain sensation intact but eliminate the capability of responding to pruritic stimuli. Pain and itch induce different reflex actions: pain results in withdrawal, itch creates the urge to scratch. Opioids relieve pain but can produce pruritus, particularly if administered directly into the cerebrospinal fluid. Itch appears to be a problem unique to the skin, while pain can arise from other organs. Both pain and itch are mediated by similar chemicals, including histamine, tissue proteases and prostaglandins [8].

Previous reports have suggested that brachioradial pruritus is associated with solar damage, and the term brachioradial solar pruritus has been suggested. [9] However, other studies have implicated cervical spine disease in patients with brachioradial pruritus. [2] Proposed mechanisms for radiculopathy-associated pruritus suggest that lesions in sensory afferent nerve fibers lead to a hyperexcitable state by interfering with pathways descending from an inhibitory center responsible for pain and pruritus modulation [3]. There is considerable support for the view that brachioradial pruritus may be primarily attributed to nerve injury [2,3,10]. Nerve conduction studies recently showed a correlation between anogenital pruritus and lumbosacral radiculopathy. This finding was supported by a significant clinical reduction in pruritus after paravertebral blockade, as assessed by the patients [6].

Figure 1 compares the typical body locations of lichen simplex chronicus and neuropathic pruritus. There is a remarkable overlap in locations, which may suggest that some cases of LSC

Figure 1. Typical locations of itch in neuropathic pruritus and lichen simplex chronicus



are in fact a form of neuropathic pruritus with lichenification due to persistent scratching. Sites such as forearms and groin are virtually identical, while sites such as shins in LSC, thighs in neuropathic pruritus, neck in LSC, and scalp in neuropathic pruritus are similar. The only site with no overlap at all is notalgia paresthetica in neuropathic pruritus. Commonly, localized macular amyloidosis or a friction dermopathy is seen over sites of notalgia paresthetica (upper back), suggesting a non-lichenifying cutaneous response to persistent scratching.

The treatment of patients with neuropathic pruritus has proven difficult. Previous studies have demonstrated the limits of topical corticosteroids and oral antihistamines [2,6,11]; and capsaicin cream, noted for its anti-pruritic properties due to desensitization of nerve endings, has not been shown to be more effective than placebo in randomized controlled studies [4,12-14]. However, anti-epileptic medications have been successful, including both lamotrigine with its blockade of sodium and to some extent calcium channels and the resultant abnormal central nervous system activity [15,16], and gabapentin, a γ-aminobutyric acid (GABA) analogue with known benefit for peripheral neuropathies [15]. In our experience, some cases of neuropathic pruritus improve significantly when treated with oral duloxetine hydrochloride (Cymbalta®, Eli Lilly, USA) at daily doses of 30–60 mg. Significant clinical response in patients with known neuropathic itch has also been noted with paravertebral blockade using lidocaine together with cervical spine manipulation and physiotherapy [2,12,17]. In our experience a nerve block using steroids and lidocaine may help relieve the symptoms of anogenital pruritus and brachioradial pruritus [6]. LSC is commonly treated by super-potent topical steroids but is often recalcitrant to treatment.

Corticosteroids suppress inflammation and decrease erythema, swelling, heat and local tenderness. These affect both the cellular and humoral branches of the immune system. Lidocaine is a sodium channel blocker that modulates the peripheral as well as the central nervous system and can block the terminal branches of nociceptors. Lidocaine is believed to exert its suppressive effects by spontaneous ectopic discharges of injured nerve. At times a single administration of the drug may completely eliminate the pain or itching through a change in the nerve action potential setting [18].

This study had some limitations, such as the small number of patients with scalp dysesthesia. The findings indicate a possible neuropathy in many cases of localized pruritus, and in view of the similarities in location suggest that localized neuropathy may play a pathoetiologic role in LSC. Further studies examining LSC patients for neuropathy are warranted. We suggest that some cases of LSC may in fact be of neuropathic etiology. Therefore, when evaluating and treating patients with LSC, one must consider this possibility.

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"Since my house burned down
I now own a better view
of the rising moon"

Mizuta Masahide (1657-1723), Japanese poet and samurai