

THERAPEUTIC UPDATE



Therapeutic Update on Hyperhidrosis

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Hyperhidrosis is defined as non-physiological, excessive sweating that is not caused by physical activity, which occurs in a localized, symmetrical distribution. It affects from 2.8% - 5% of the population and can negatively impact one's quality of life due to embarrassment and shying away from social interactions. The most frequently affected areas are the axillae, palms, soles, face, and groin. While the precise etiology of focal hyperhidrosis is unknown, it is thought that sympathetic overstimulation of normal eccrine glands is the mostly likely cause. The onset usually occurs during childhood or adolescence; 30%-50% of patients have a positive family history. During sleep, hyperhidrotic individuals sweat normally. Interestingly, patients with axillary hyperhidrosis usually do not have bromhidrosis (pungent sweat odor).¹ Due to recent drug development and breakthrough technology, there are now several treatment options available. Choice of therapy may depend on the severity of sweating and the locations involved.

I. Topical Antiperspirants

Topical solutions are the most commonly used first-line, least costly option. Aluminum chloride solutions in 10% - 15% concentrations are used to reduce axillary sweating or palmo-plantar hyperhidrosis. The aluminum temporarily occludes the sweat glands. Localized primary irritant contact dermatitis can occur, which can limit its use. Recently, a new topical formulation containing 15% aluminum chloride and 2% salicylic acid showed that 75% of 30 patients were somewhat or very satisfied after treatment. Mean HDSS (hyperhidrosis disease severity scale)*² scores decreased from a baseline of 3.3 to 2.12 by 3 months.³ The non-alcohol gel vehicle was less irritating than an alcohol base.⁴

II. Botulinum Toxin A (BTX-A) Injections

BTX-A injections can be delivered subdermally in the axillae, palms, or soles. Repeated injections are necessary every 6 to 12 months. BTX-A works by blocking the release of acetylcholine, a neurotransmitter secreted by sympathetic nerves innervating the sweat glands. Highly effective in achieving greater than a 90% reduction in sweating in more than 90% of patients, maintenance costs are relatively high. Typical starting doses are 50

units of BTX-A per axilla or 100 units of BTX-A per palm. The main contraindications to botulinum toxin therapy include neuromuscular disorders such as myasthenia gravis, pregnancy and lactation.⁵

III. Oral Anticholinergics

Oral medication, such as glycopyrrolate and propantheline bromide can diminish sweating; however, due to systemic anticholinergic side effects such as dry mouth, blurred vision, constipation, and urinary obstruction, systemic anticholinergics are often not well tolerated. Other agents such as clonazepam, diltiazem, clonidine, and paroxetine have also been useful in isolated cases.^{6,7}

IV. Iontophoresis

A series of sessions delivering micro amounts of electric current through tap water can diminish palmo-plantar sweating. While the mechanism of action remains unknown, it may result from plugging the eccrine sweat gland pores or by a complex mechanism involving changes in reabsorption of sodium. Low-cost maintenance therapy is needed for sustained efficacy.⁸

V. Surgery

Direct excision of sweat glands under visualization has been performed in the axillae.⁹ Also, liposuction with tumescent anesthesia using a blunt or specialized cannula to rasp the undersurface of the dermis has been done. These surgical methods are often associated with swelling and bruising, and require healing time.^{10,11,12} Patients with severe sweating who have been recalcitrant to conventional therapy can undergo an endoscopic transthoracic sympathectomy. While surgical ablation of the sympathetic nerve chain supplying the sweat glands in the axillae or hands can be effective with long-term results, the risk of injury to the lungs and other nerve structures in the chest is significant. Often, the bothersome side effect of compensatory hyperhidrosis of the lower portion of the body occurs post-operatively.¹³

VI. Energy-Based Devices

1. Lasers

In one pilot study of six patients, a long-pulsed Nd:YAG (Candela) at hair reduction settings yielded improvements in subjective and objective measures of axillary sweating up to 9 months; however, there were no changes in the histology of axillary skin.¹⁴ In another study, a long-pulsed 800 nm. diode laser (Light Sheer/Lumenis) used to deliver 5 cycles of laser treatment at monthly intervals to 21 patients on 1 axilla only (with the contralateral side serving as the control) failed to show significant sweat reduction compared to the untreated side.¹⁵ Most recently, 15 subjects with axillary hyperhidrosis were treated

TABLE 1.

Hyperhidrosis Disease Severity Scale: A 4-point Scale To Determine The Degree of Severity of Hyperhidrosis

Score 1	My sweating is never noticeable and never interferes with my daily activities
Score 2	My sweating is tolerable but sometimes interferes with my daily activities
Score 3	My sweating is barely tolerable and frequently interferes with my daily activities
Score 4	My sweating is intolerable and always interferes with my daily activities

with the Nd:YAG 1440 nm wavelength with a unique delivery fiber (PrecisionTx™) and the Smartlipo Triplex™ device (Cynosure). In a minimally invasive approach, the targeted fiber is inserted under the skin with a temperature-sensing device to safely heat the underlying sweat glands. 72% reported a two-point HDSS score improvement and 28% reported a one-point improvement at one-year follow-up.¹⁶ Additional large, multi-center studies with long-term follow-up are warranted to further evaluate laser treatment of hyperhidrosis.

2. Microfocused Ultrasound

A microfocused ultrasound device that has been cleared by the FDA for noninvasive eyebrow lifting and lifting of the submental area, has been recently used in two randomized, double-blinded, sham-controlled pilot studies (14 patients and 20 patients respectively, to treat axillary hyperhidrosis).¹⁷ High intensity microfocused ultrasound plus visualization was used to deliver energy to the sweat glands. The pilot studies revealed a 50-60% positive treatment response at 1 year. Further studies are warranted to explore the merits of ultrasound in the treatment of hyperhidrosis.

3. Microwave

Microwaves, preferentially absorbed by high water-content tissue, lead to heating of the dermal adipose interface where the sweat glands reside. The targeted heating results in thermolysis of the eccrine glands. The miraDry® (Miramar Labs) is the first FDA-cleared (January 2011) microwave device for lasting treatment of underarm sweat. A vacuum pump is used to lift the skin away from underlying structures such as nerves; active cooling is used to protect overlying epidermis and dermis. Usually, a second treatment is given 3 months after the first for lasting results.² A study of 31 patients showed 90% efficacy and 90% patient satisfaction after 1 year. Efficacy was defined as a drop in HDSS from 3 or 4 to 1 or 2. The average patients' sweat was reduced by 82%.¹⁸ Histology revealed sweat gland necrosis at 11 days post treatment and reduction of sweat glands 6 months post treatment.² All subjects experienced transient effects in the treatment area, such as swelling, discomfort or numbness; the most common adverse event was altered sensation in the skin of the upper arm, which resolved in all cases.¹⁹

Theoretically, since sweat glands do not regenerate, complete destruction of sweat glands should result in a permanent solution.

Conclusion

There are many treatment options today for patients with axillary or palmoplantar hyperhidrosis. Further research and development of drugs and devices, and fine tuning of treatment protocols will undoubtedly improve safety, efficacy, and longevity of results.

Disclosure

Dr. Sarnoff has no relevant conflicts of interest to disclose.

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