Hyperhidrosis: An Approach to Diagnosis And Management

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Hyperhidrosis is defined as focal or generalized excessive sweating with a prevalence of 2.8% of the general population. This medical condition is associated with significant psychosocial morbidity and has a dramatic impact on activities of daily living. A significant proportion of patients do not consult a physician for this condition. Early diagnosis is essential in order to implement management strategies that have excellent efficacy rates and patient satisfaction.

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Primary focal hyperhidrosis is excessive sweating of the axilla, palms, soles, or face that interferes with activities of daily living. This condition has a reported prevalence of 2.8% of the population and is associated with significant psychosocial morbidity (Strutton, Kowalski, Glasser, & Stang, 2004). It is essential to distinguish primary focal hyperhidrosis, which is idiopathic, from secondary hyperhidrosis, which can be due to a variety of medical conditions (see Table 1). Secondary hyperhidrosis can have a focal or generalized clinical presentation, affecting the entire body. The Multi-Specialty Working Group on Hyperhidrosis defines primary focal hyperhidrosis as focal, visible, excessive sweating of at least 6 months duration without apparent cause with at least two of the following characteristics: bilateral and relatively symmetric, frequency of at least one episode per week, impairs daily activities, age of onset less than 25 years, positive family history, and cessation of focal sweating during sleep (Hornberger et al., 2004). Primary focal hyperhidrosis does not require any further laboratory investigations. Associated symptoms such as fever, night sweats, or weight loss should be considered red flags and require further investigation for causes of secondary hyperhidrosis.

Epidemiology

Primary focal hyperhidrosis has an average age of onset of 25 years; however, a large proportion of patients report having their symptoms for as long as they can remember. It would appear that hyperhidrosis is a disease of childhood which may peak in early adulthood. The most common site of involvement is the axilla followed by the soles, palms, and face. A large epidemiologic survey revealed that approximately 70% of people did not consult a physician for this presentation (Strutton et al., 2004). Over 50% of patients with focal hyperhidrosis reported feeling less confident, 34% reported feeling unhappy, 38% reported feeling frustrated with daily activities, and 20% reported feeling depressed. Close to half of all patients with focal hyperhidrosis felt that their sweating had a moderate-to-severe effect on limitations at work, meeting with people, and in romantic situations. There is a positive family history in 30% to 50% of patients.

Pathophysiology

Hyperhidrosis is a disease of the eccrine sweat glands. The human body has up to 4 million sweat glands, of which approximately 3 million are eccrine sweat glands. The remainder are apocrine glands which are not involved in hyperhidrosis. Hyperhidrosis appears to be due to excessive sympathetic activity as there are no histopathologic changes of the eccrine glands (Sato, Kang, Saga, & Sato, 1989).

Treatment

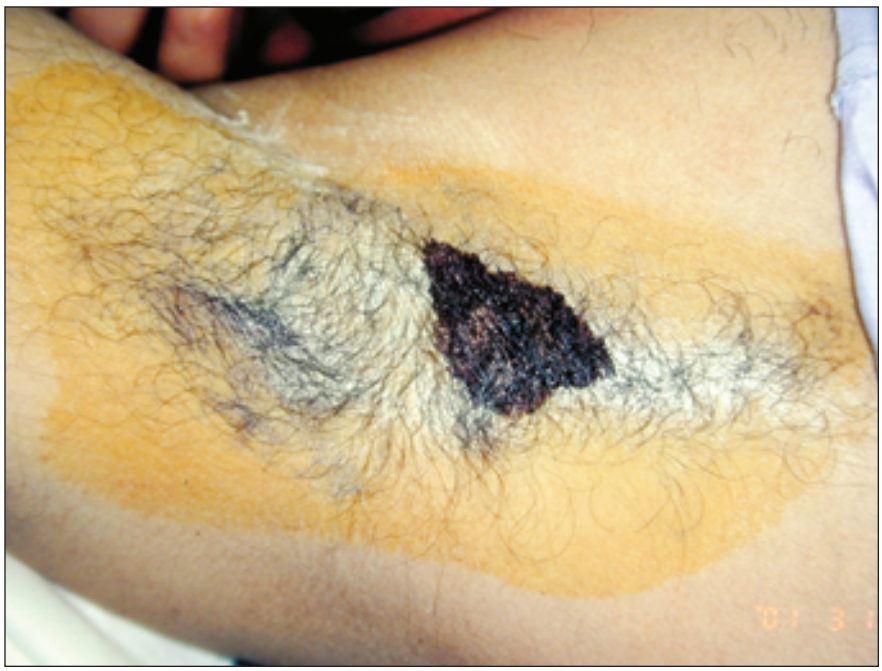
Treatment of hyperhidrosis can be divided into topical, oral, surgical, and nonsurgical treatments (botulinum toxin). These therapeu-

Table 1.
Etiology of Generalized and Focal Hyperhidrosis

Generalized Hyperhidrosis
- Drugs/Toxins
  - Alcoholism
  - Substance abuse
- Cardiovascular
  - Heart failure
  - Shock
- Respiratory Failure
- Neurologic
  - Parkinson's disease
  - Spinal cord injury
  - Cerebrovascular accident
- Endocrine
  - Hyperthyroidism
  - Diabetes mellitus
  - Pheochromocytoma
  - Carcinoid syndrome
  - Acromegaly
  - Pregnancy
  - Menopause
- Infections
- Malignancies
  - Hodgkin's disease
  - Myeloproliferative disorders

Focal Hyperhidrosis
- Primary idiopathic
  - Axillary/Palmar/Plantar/Facial/Gustatory (Frey's syndrome)
- Secondary to neuropathies, spinal disease or injury

Figure 1.
A starch iodine test results in purple to black discoloration which delineates the affected area of excessive sweating.



tic options differ with respect to their efficacy, duration of action, side effects, and cost of treatment. These treatment options and their specific indications will be discussed.

Topical treatments. Topical treatments are limited to antiperspirants (Drysol®, Xerac®) containing aluminum chloride in concentrations ranging from 20% to 25%. The mechanism of action involves mechanical obstruction of the eccrine gland duct (Shelly & Jurley, 1975). The major limitation of aluminum chloride is localized burning, stinging, and irritation. The main indication for these products is as a first-line treatment for mild axillary hyperhidrosis.

Systemic treatments. Oral anticholinergic agents such as glycopyrrolate or amitriptyline represent the main systemic medications for hyperhidrosis. They inhibit synaptic acetylcholine and therefore interfere with neuroglandular signaling (Connolly & de Berker, 2003). The main limitation of these drugs is the fact that the doses required to achieve a beneficial response in hyperhidrosis result in adverse effects such as dry mouth, blurred vision, constipation, and urinary retention. As a result their use is limited and not well established in primary focal hyperhidrosis.

Iontophoresis. Iontophoresis involves the passage of ions by means of an electrical current into the skin. This electrical charge appears to occlude the eccrine duct and interferes with eccrine gland secretion. The main indication for iontophoresis is in palmar or plantar hyperhidrosis, where the efficacy ranges from 80% to 90% (Sloan & Soltani, 1986). The main limitation of this therapeutic modality is that it is time consuming (requires 30 to 40 minutes per treatment site daily for at least 4 days of the week) and may cause skin irritation, dryness, or peeling. Sweating is well controlled after 6 to 10 treatments; however, long-term maintenance therapy is generally required at 1 to 4 week intervals. Iontophoresis is considered a second-line treatment for palmar or plantar hyperhidrosis, following aluminum chloride antiperspirants.

Surgical treatments. Surgical treatment primarily involves thoracoscopic sympathectomy with success rates in the range of 80% to 90% for primary focal hyperhidrosis of the axilla, palms, soles, and face (Doolabh et al., 2004). A major limitation of this surgical procedure is compensatory hyperhidrosis with an incidence of 80%. Other surgical complications include pneumothorax and hemothorax. Although this procedure has a high efficacy rate, the associated risk of complications necessitates proper patient selection (generally those with severe hyperhidrosis who are unresponsive to other treatments) and detailed informed consent to avoid unnecessary frustration following treatment. Other surgical procedures with reported efficacy in axillary hyperhidrosis include liposuction and subcutaneous curettage (Hornberger et al., 2004).

Table 2.
Hyperhidrosis: Key Elements of Patient Assessment

Medical History Focusing on:
- Focal vs. generalized presentation
- Duration and frequency of episodes
- Age of onset
- Family history
- Symptoms of fever, night sweats or weight loss
- Screening for symptoms / signs of low mood or depression

Social History Focusing on:
- Impact of hyperhidrosis on activities of daily living such as social interactions and occupational activities

Physical Exam Focusing on:
- Identifying anatomic sites with excessive sweating
- Ensure the absence of physical findings suggestive of secondary hyperhidrosis

Patient Education Focusing on:
- Reassurance that this is a medical condition and patient does not need to feel embarrassed to discuss it
- Prevalence and prognosis
- Treatment options and efficacy
- Followup is essential to ensure treatment response and treatment satisfaction

Botulinum toxin A (Botox®). Botulinum toxin is produced by *Clostridium botulinum* and acts by inhibiting acetylcholine release at the neuromuscular junction. Botulinum toxin has a reported efficacy of greater than 90% for primary focal hyperhidrosis of the axilla, palms, and soles (Heckmann, Ceballos-Baumann, & Plewig, 2001; Lowe et al., 2002; Naumann & Lowe, 2001; Naumann, Hamm, & Lowe, 2002; Voudoud-Seyedi, Simonart, & Heenen, 2000). This treatment method is extremely safe. Transient intrinsic muscle weakness is reported in less than 1% of patients treated for palmar hyperhidrosis. The major contraindications include neuromuscular disorders such as myasthenia gravis, pregnancy and lactation, organic causes of hyperhidrosis, and medications that may interfere with neuromuscular transmission. The cost of the drug and need for repeated treatments appear to be a notable limitation to this modality.

Botulinum toxin for axillary hyperhidrosis is a safe, well tolerated, and highly efficacious treatment modality. Dosages range from 50 to 100 units per axilla. The usual starting dose is 50 units per axilla. A starch iodine test is often used and results in purple to black discoloration which delineates the affected area of excessive sweating (see Figure 1). Pain associated with these intradermal injections is minimal; however, a topical anesthetic can be used to further minimize the discomfort. The mean duration of effect is 6 to 7 months.

Botulinum toxin for palmar or plantar hyperhidrosis is also reported to be safe and effective; however, the main limitation of this indication is the fact that most patients find the injections in the palms and soles quite painful. Therefore, a regional nerve block is required prior to the botulinum toxin injections. The duration of efficacy for palmar and plantar hyperhidrosis treated with botulinum toxin is in the range of 4 to 6 months.

Conclusion

Primary focal hyperhidrosis is a common condition associated with significant psychosocial morbidity. This condition requires early detection and diagnosis in order to implement treatments which are highly efficacious (see Table 2). Health care professionals must be aware of the risks, benefits, and reasonable expectations of the available treatment modalities. With proper screening, education, and therapeutic intervention, the quality of life of patients suffering from hyperhidrosis can be enhanced.

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continued on page 523

Hyperhidrosis

continued from page 517

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