12 Hyperhidrosis (Excessive Sweating)

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Key Points

- Excessive sweating can be localized (e.g. hands or feet) or generalized, primary or secondary. Generalised hyperhidrosis is more likely as a result of an underlying condition.
- If the generalized sweating is of recent onset and/or associated with other symptoms such as fever, weight loss, fatigue or swollen glands, then a thorough search for an underlying cause should be made.
- Treatment of generalised hyperhidrosis is usually by dealing with the underlying cause and perhaps with systemic medicines.
- Localised hyperhidroses is often idiopathic (of no known cause) and may be hereditary.
- Primary idiopathic focal hyperhidrosis usually stops during sleep.
- Focal hyperhydrosis often responds to local measures such as powerful antiperspirants, iontophoresis or botulinum toxin (Botox©).

What to Tell the Patient

- Wearing appropriate clothing and pads may help. Staying calm and cool is also important.
- Special garments are available with a sweat-absorbent wicking interior that pulls sweat away from the body and an ultra-thin, extremely breathable, sweat-repellent exterior to block sweat stains from showing. Open sandals or leather soled shoes can also help.
- Self help groups such as www.sweathelp.org or www.hyperhidrosisuk.org are great resources for patients.

12.1 Introduction

Hyperhidrosis is a disease characterised by sweating (perspiration) in excess of the normal physiologic amount necessary to maintain body temperature. Primary or idiopathic hyperhidrosis and secondary hyperhidrosis are the two main categories. Patients can have excessive sweating either in a localized area (focal) or over the entire body (generalised). Primary disease is usually localized, affecting the soles, palms, and axillae in various combinations and with varying degrees of severity (Fig. 12.1). Secondary hyperhidrosis can be generalised or focal. In secondary hyperhidrosis the symptoms are due to one of a large number of medical conditions, including endocrine disorders, neurological problems, use of certain drugs, cancer, chronic infections, dermatologic syndromes, and conditions associated with excess catecholamine discharge (Table 12.1).

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Fig. 12.1 Hyperhidrosis of the feet

Table 12.1 Causes of generalized sweating

Infections: Acute viral or bacterial infections; chronic infections, e.g.: TB, malaria, brucellosis.
Drugs: Alcohol, cocaine, heroin, ciprofloxacin, acyclovir, esomeprazole, antidepressents, propranolol, etc.
Endocrine: Diabetes, hyperthyroidism, menopause, pregnancy, carcinoid syndrome, hyperpituitarism, pheochromocytoma, acromegaly.
Neurological: Stroke, spinal cord injury, gustatory after parotidectony or primary gustatory, Parkinson's disease.
Others: Lymphoma and other myeloproliferative disorders, congestive cardiac failure, anxiety, obesity, rheumatoid arthritis.

12.2 Clinical Features and Diagnosis

Some patients can be very embarrassed with their excessive sweating which can ruin clothes, make writing or shaking hands difficult and can interfere with certain occupations or sports (e.g.: golf, tennis, rock climbing). Bromohydrosis (smelly sweating) can often make the problem even more troublesome for the patient. Many are reluctant to seek medical help in the mistaken belief that nothing can be done. Idiopathic focal hyperhidrosis usually starts in childhood although many patients delay seeking medical help until they reach adult life. Between a third and half of the patients have a positive family history. Interestingly, idiopathic focal hyperhidrosis does not cause excessive sweating during sleep.

Hyperhidrosis is usually diagnosed clinically. If the presentation is characteristic of primary focal hyperhidrosis and there is no evidence of an underlying cause, no laboratory tests are required. If there is a suspicion of secondary hyperhydrosis due to some medical condition special tests and investigations may be required (Table 12.2).

There are various methods to quantify the amount of sweat being produced on the palms or axilla such as gravimetric measurement. This test is often utilized in clinical trials and is not part of routine clinical practice. After drying the surface, a pre-weighed filter paper is applied to the palm or axilla for a period of time measured by stopwatch. The paper is then weighed and the rate of sweat production is calculated in mg/min. >20 mg/min in men and >10 mg/min in women in the axilla is considered excessive.

Table 12.2 Investigations for hyperhidrosis if an underlying medical cause is suspected

• Full blood count
• Blood film for malarial parasites if overseas travel
• ESR and/or CRP
• Renal function tests and electrolytes
• Liver function tests
• Fasting blood glucose or HBA1C
• Thyroid function tests
• Chest x-ray (may be useful to identify an intrathoracic neoplasm)
• HIV testing
• Urinalysis
• Hormonal studies in women in the perimenopausal age group (LH, FSH + oestrogen)

12.3 Differential Diagnosis

Excessive sweating may be focal or generalised, primary or secondary. Most cases of generalised sweating are due to an underlying cause (see Tables 12.1 and 12.3). If the generalised sweating is of recent onset and/or associated with other symptoms such as fever, weight loss, fatigue or swollen glands, then a thorough search for an underlying cause should be made (Table 12.2).

Focal hyperhidrosis is far more common and can affect up to 1% of the population (Table 12.4). It usually affects the hands, feet, axilla, face or scalp. Treatment depends on the location, the severity and the ability of the patient to cope.

12.4 Pathophysiology

Although the exact pathophysiology of primary hyperhidrosis is yet to be determined, there is much evidence for abnormalities in autonomic nervous system function. Since hyperhidrosis often begins in childhood and can be familial, the physiologic basis for this disorder may be genetically determined [1].

Sweat glands in patients with hyperhidrosis are not histopathologically different from those in normal patients, nor is there an increase in the number or size of glands. The condition is caused by hyper function of the sweat glands rather than hypertrophy [2]. Patients with primary hyperhidrosis have a higher-than-normal basal level of sweat production as well as an increased response to normal stimuli such as emotional or physical stress.

12.5 Treatment

Simple measures include frequent showers, loose clothing, wearing black or white shirts, *antiperspirants* and deodorants may help. Special garments are available with a sweat-absorbent wicking interior that pulls sweat away from the body and an ultra-thin, extremely breathable, sweat-repellent exterior to block sweat stains from showing. Patients should avoid triggers such as excessively hot rooms or spicy foods. Leather soled shoes or open sandals may help with sweaty

Table 12.3 Hyperhidrosis assessment:

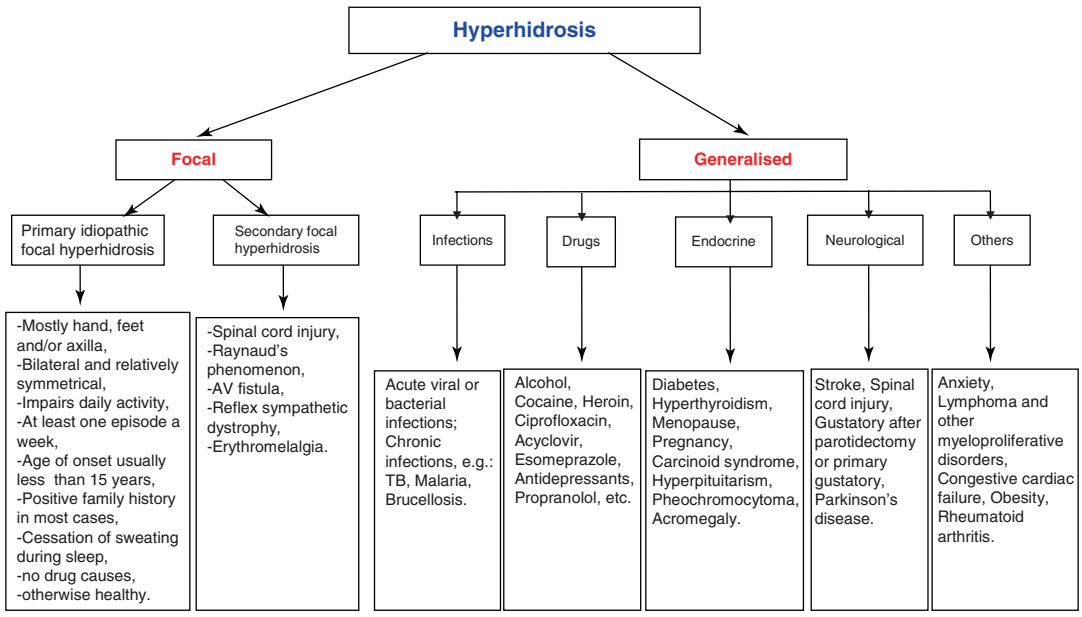

Table 12.4 Criteria for diagnosing ideopathic focal hyperhidrosis

Focal, visible, excessive sweating for at least 6 months duration without any apparent cause and with at least 2 of the following
• Bilateral and relatively symmetrical
• Impairs daily activity
• At least one episode a week
• Age of onset less than 15 years
• Positive family history
• Cessation of sweating during sleep

feet. Adsorbent insoles and disposable axillary pads can also be extremely helpful. Self help groups can be very supportive for patients (See Patient information leaflet on Chap. 66).

Many patients may have already tried these simple methods. Assuming there is no underlying cause, the next step is to try a more potent antiperspirant such as 20% aluminium chloride ("Driclor®", "Anhydrol Forte®" or "Sweat Stop®"). These usually come as a role-on or spray and can be used on the axilla, hands or feet. Aluminium chloride is a metal salt that physically blocks the ducts that drain the sweat glands. They come in various strengths. A 20% solution is the standard strength but lower concentrations may be necessary for the face and axilla and higher concentrations may be required for the hand and feet. Aluminium chloride can be quite irritating initially and should be applied overnight and washed off in the morning every second day for the first week or two. If there is a lot of irritation at the start of treatment a potent topical steroid may help if applied in the morning for the first week or two. It may take up to 2 weeks to see results with aluminium chloride. An ordinary antiperspirant/deodorant can be used in the morning during treatment.

If topical agents do not help, the next treatment to consider is *iontophoresis*. This is applied using shallow trays filled with water and a small electrical current from a battery is passed through the water. The exact mechanism of action is unclear but this method can significantly reduce focal sweating in 85% of patients. The hands and/or feet can be placed in the trays for 20–30 min alternate nights initially but the frequency can be reduced after 2–3 weeks to twice a week if there is a response. "Idrostar®" has a direct pulsed current which is more suitable for children and those with sensitive skin and it also comes with axillary pads (www.iontophoresis.info).

0.05% glycopyrrolate solution can be added to water to enhance the response. Most patients buy their own unit for home use. For axilliary hyperhidrosis small arm pads soaked in water and attached to the machine may help but the best results are obtained when iontophoresis is used for the hands and feet. It should not be used in patients with pacemakers, metal implants or in pregnancy.

For severe resistant cases of hyperhidrosis, *botulinum toxin* (e.g. "Botox®") can be very effective. It is given intradermally and blocks acetylcholine release and neurotransmission. It is most suitable for axillary hyperhidrosis and can cause 75–100% reduction in sweating for up to 6–9 months. It is less effective and more painful to use on the hands.

Generalised hyperhidrosis is best managed by dealing with the underlying cause (see Table 12.1). Oral anticholinergics, which are normally licensed for urinary frequency, can be very helpful in patients with generalised hyperhidrosis or patients with severe resistant forms of focal hyperhidrosis. They are contraindicated in patients with myasthenia gravis, pyloric stenosis, and ileus and they need to be used with caution in patients with narrowing angle glaucoma, gastro-oesophageal reflux, bladder outlet obstruction and heart failure. Probanteline bromide 15–30 mg three times a day, later increasing to 50 mg three times a day as required, may help. Oxybutyline 2.5 mg daily, gradually increasing to 2.5 or 5 mg twice a day is also useful. "Lyrinel XL®" 5 mg once daily is a new long acting oxybutynin anticholinergics which has a convenient once a day dose. Some patients may need to gradually increase the dose up to 30 mg daily. Dry mouth is a problem with all anticholinergics, especially at high doses [3].

Other drugs worth considering are beta blockers (e.g. propranolol 40 mg tid) or calcium channel blockers (e.g. diltiazem 60 mg tid). These may take 2 weeks before patients will see results.

Peri-menopausal sweating is best dealt with by hormone replacement therapy (HRT). For women who cannot or will not take HRT, clonidine, methyldopa or SSRI anti-depressants may help [4, 5].

Endoscopic thoracic sympathectomy was used in the past but it can cause compensatory hyperhidrosis in other areas of the body in up to 60% of cases and there have been some fatalities with this procedure which has now fallen out of favour.

Laser sweat gland ablation for axilliary hyperhidrosis is coming on stream but its effectiveness is yet to be established.

Facial hyperhidrosis can be difficult to manage. Topical 0.5% glycopyrronium bromide cream (100 g) is expensive but may help. Weaker forms of aluminium chloride combined with Aloe Vera are available in a spray formulation which can be used on the face ("Sweat Stop®"). Oral anticholinergics can be used in severe cases of facial hyperhydrosis.

Some patients with foot hyperhidrosis may develop **pitted keratolysis**. This causes multiple small white smelly pits on the sole of the feet usually sparing the arch of the foot. It is usually caused by several bacterial species including kytococcus and corynebacteria species. Treatment is with a topical antibiotic such as fusidic acid ("Fucidin®") twice a day for 7–14 days. More severe cases may respond to oral antibiotics such as erythromycin for 7 days followed by measures outlined above to reduce sweating.

12.6 Conclusion

Excessive sweating is a common and embarrassing condition. A careful history, a thorough physical clinical examination and investigations may be necessary to distinguish between primary idiopathic hyperhidrosis and hyperhidrosis secondary to an underlying medical condition. Fortunately most cases of primary idiopathic hyperhidrosis can be managed with topical therapies, oral medications, botulinum toxin or special techniques such as iontophoresis.

Useful Website

http://www.sweathelp.org/ (USA site)
www.hyperhidrosisuk.org (UK site)

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