CASE REPORT
A 35-year-old female presented with history of colored sweat over the face and neck along with staining of her dresses and undergarments. The colored sweat causing discoloration of face was easily removable with soap and water, but would reappear later. She was a housewife. No history of prolonged exposure to any drugs, no recent history of intake of any colored foods, no history of exposure to any dyes, paints, coal or any other chemicals. Urine, saliva and tear color was normal. All baseline investigations including urine examination were found to be normal.
- Urine homogentisic acid levels were normal
- Bleeding and clotting time were normal
- Liver function tests were normal
- Blood and urine cultures were negative
- Scrapings from the skin and biopsy results were inconclusive (Figure 3).

DISCUSSION
Sweat glands are small tubular structures of the skin that produce sweat. There are two kinds of sweat glands: (1) eccrine and (2) Apocrine sweat glands, which are referred to as sudoriferous glands.

Eccrine and Apocrine Glands
The eccrine glands are found all over the body and function throughout our life. They secrete a clear, odorless fluid that serves to regulate body temperature.\(^1\)

Apocrine glands develop during puberty and are most active throughout adulthood and are located in the armpits, areolar, genital, and anal areas. Apocrine glands secrete a thick, milky sweat that, once broken down by bacteria, is the main cause of body odor (Figure 4).\(^2\)
Definition of Chromhidrosis and Pseudochromhidrosis

- It is the production of colored sweat by eccrine or apocrine sweat glands
- Eccrine chromhidrosis is very rare
- Chromhidrosis is most often apocrine in origin. Although apocrine glands are found in the genital, axillary, areolar, and facial skin, chromhidrosis is reported only on the face, axillae, and breast areola. It is brown, black, blue or green in color
- Pseudochromhidrosis is the production of colorless sweat, which becomes colored when it reaches the skin secondary to some offending agents like drugs, bacterial infections (corynbacterium), coal, dyes, paints and colored foods.

Incidence

- Incidence statistics are not available as chromhidrosis is rare. There have been few reports of chromhidrosis in the literature

Case Studies

Figure 3: Biopsy site

Figure 4: Types of sweat glands

Source: Mayo Foundation for Medical Education and Research

Chromhidrosis was first case was described in 1709 by Yonge. Limited research on etiology as it is a very rare condition and not associated with systemic disorders.

Age

Chromhidrosis is noted after puberty, when the apocrine glands are activated.

Pathophysiology and Etiology of Chromhidrosis

Lipofuscin is a yellowish brown pigment that is normally found in the cytoplasm of relatively non-dividing cells. In chromhidrosis, lipofuscins are found in a higher-than-normal concentration or a higher-than-normal state of oxidation in apocrine glands. This increased level of oxidation results in the green, blue and even black sweat seen in chromhidrosis.

DIFFERENTIAL DIAGNOSIS (FIGURE 5)

- Hyperbilirubinemia
- Pseudomonas infection
- Bleeding diathesis
- Alkaptonuria
- Addison’s disease
- Hemochromatosis

INVESTIGATIONS

No significant laboratory abnormalities have been noted with apocrine chromhidrosis.

The following test may help to rule out other causes:

- Determination of complete blood cell counts to exclude bleeding diathesis
- Tests of urinary homogentisic acid levels to exclude alkaptonuria
- Fungal and bacteriologic cultures to exclude infectious causes of pseudochromhidrosis
- Wood lamp examination of colored sweat may be positive
- If no sweat is produced at the time of the test, manual expression or pharmacologic stimulation with intradermal epinephrine or oxytocin (Pitocin) can be used to stimulate sweat secretion
- Clothing fibers in contact with the secretions may also fluoresce yellow-green with standard ultraviolet (UV) microscopy.
Chapter 178  An Interesting Case of Orange Colored Sweat

Capsaicin
A few reports have described successful treatment of chromatidrosis with capsaicin cream. Capsaicin, a crystalline alkaloid found in red peppers, is commonly used for the temporary relief of pain from rheumatoid arthritis, osteoarthritis, and neuralgias. Capsaicin depletes neurons of substance P, a neurotransmitter important in apocrine sweat production. Clinical relapse occurs when therapy is stopped.

Pseudochromhidrosis (Figure 8)
The causative factor has to be removed and treatment with antibiotics as infection is the most common cause.

COMING BACK TO THE CASE
This patient was presented with orange sweat and stained garments. All investigations pertaining to chromatidrosis and its differential diagnosis were negative, hence was considered as pseudochromhidrosis probably secondary to some dietary habits or infectious etiology and was treated with macrolide antibiotics for a week and showed response.

Some Interesting Facts

Causes of Orange Sweats
- Certain lotions containing sun protection factor (SPF) ingredients or sunless tanning lotions when used the orange sweat stains may be caused by the pH of our sweat (too acidic).
- Certain foods like onions, garlic, cola, sodas and spicy foods in large amounts cause colored sweat.

Some Different Colors of Urine

Red or Pink Urine (Figure 9)
- Blood
- Foods (beets, blackberries and rhubarb can turn urine red or pink)
- Rifampin.

Orange Urine (Figure 10)
- Medications that can turn urine orange include rifampin; the anti-inflammatory drug sulfasalazine, phenazopyridine (Pyridium), certain chemotherapy drugs
- Dehydration

Histopathology in Chromhidrosis
The apocrine glands appear normal in size and morphology, but the number of glands varies. The increased number of yellow-brown lipofuscin granules is observed in the cytoplasm of secretory cells on routine hematoxylin-eosin staining (Figure 6). The granules are positive on periodic acid, Schiff stains and demonstrate autofluorescence under a UV excitation wavelength of 360–395 nm.

Treatment of Chromhidrosis
Apocrine chromatidrosis has no fully satisfactory cure or treatment. Patients can manually or pharmacologically empty the glands to achieve a symptom-free period of about 48–72 hours or until the glands replenish the pigment. BOTOX® is predominantly used to decrease eccrine sweat in persons with hyperhidrosis. However, recent reports demonstrated improvement of facial and axillary chromatidrosis with BOTOX®. BOTOX® may suppress apocrine secretion by blocking cholinergic stimulation and substance P release (Figure 7).

Figure 6: Oxidized lipofuscin granules

Figure 7: BOTOX

Figure 8: A case of topiramate induced pseudochromhidrosis which subsided after drug removal. 15
Blue or Green Urine

- Blue diaper syndrome is an autosomal recessive metabolic disorder caused by a defect in tryptophan absorption in children
- Green urine sometimes occurs during urinary tract infections caused by pseudomonas bacteria.

WE CAN SWEAT IN DIFFERENT COLORS

Sweat can occur in different colors. It is either classified as chromhidrosis and pseudochromhidrosis. In chromhidrosis the common thread is that the color sweat is produced in the gland. This differentiates it from pseudochromhidrosis where clear sweat is produced and mixed with a colored agent when it reaches the skin (Figure 11).

CONCLUSION

Both chromhidrosis and pseudochromhidrosis are rare. Diagnosis of chromhidrosis is based on biopsy and autofluorescence of both skin specimens and stained clothing, while diagnosis of pseudochromhidrosis is based primarily on history, and successful treatment with antibiotics.

REFERENCES