

Isolated Areolar Apocrine Chromhidrosis

Joan R. Griffith, MD, MHA

ABSTRACT. A case of isolated areolar apocrine chromhidrosis in an 11-year-old female is presented. This is the youngest case cited in Medline. The goal of this review is to increase awareness of apocrine chromhidrosis among primary care providers and to discuss treatment. Capsaicin cream 0.025% is a proven treatment that may reduce the potential psychological impact and embarrassment that patients experience. *Pediatrics* 2005;115:e239–e241. URL: www.pediatrics.org/cgi/doi/10.1542/peds.2004-1561;chromhidrosis,capsaicin.

Apocrine chromhidrosis refers to the secretion of colored sweat by the apocrine glands. It is a chronic disorder that presents after adrenarche and may slowly regress with age. It may involve the face, axillae, or areolae. The case of an 11-year-old female who presented with clinical signs of areolar apocrine chromhidrosis and responded to topical capsaicin cream is discussed.

CASE REPORT

An 11-year-old white female was referred to the adolescent medicine clinic with colored discharge from both areolae. The drainage began ~3 weeks after completion of her soccer season. The drainage was initially noticed as small, dried, grayish-blue-black spots on her bra and was usually noticed more during the middle of the day. The drainage appeared intermittently without any obvious precipitating factors. It was not associated with odor, fever, pain, redness, or other constitutional symptoms. There was no history of trauma or use of any chronic medication. Her medical history was unremarkable. She had no history of any significant medical illnesses, known allergies to any foods or medicines, prior hospitalization, or surgery. She had not experienced menarche.

She was seen initially by her primary care provider, who obtained routine cultures of the expressed fluid and started her on Augmentin (875 mg orally twice a day) to exclude a possible infection. The patient denied any improvement in the drainage after taking the Augmentin for 1 week.

Her physical examination in the adolescent medicine clinic revealed a well-nourished, well-developed female in no acute distress. She had no jaundice, cyanosis, edema, acne, or unusual bruising. Examination of her head, ear, eyes, nose, and throat was normal. Her abdomen revealed no mass, organomegaly, or tenderness. Her pubic hair was Tanner III, and her breasts were Tanner II to III. Her breasts appeared normal, with no palpable masses, tenderness, erythema, or increased warmth. There was no fluid of any kind expressed from any breast milk ducts. A small amount of dark gray-blue viscous fluid was manually expressed

from the periareolar glands, located at the 12 o'clock position on her right breast without any obvious staining of the pore (Fig 1). A larger amount of light-gray, less viscous fluid was expressed from the periareolar glands in the 2 o'clock position of her left breast (Fig 2). No visible bleeding was present from either breast. There were no masses or discoloration in her axillae.

Multiple slides were prepared from the fluid from each breast to determine the presence of abnormal cytology. The option of a needle biopsy was discussed with the pathologists who prepared the slides, but it was deemed unnecessary. The initial routine cultures and Gram stains were negative, so the Augmentin was discontinued. The cytology slides revealed crystalline debris and anucleated keratinocytes. No epithelial cells were present in the fluid from either breast.

The patient's history and physical findings were most consistent with apocrine chromhidrosis. She was started on topical capsaicin cream 0.025% twice a day just before leaving for a 2-week family vacation. She was seen for follow-up ~3 weeks after capsaicin was prescribed. She reported initial irritation with applications, but it gradually improved. She noticed a decrease in the volume and frequency of drainage from her breasts.

On subsequent follow-up, she had only been using the cream twice a day for the past 4 to 5 days because she did not use it while on vacation. In follow-up the fluid in each breast was smaller in volume, less viscous, less dark, and required more pressure to express.

The patient demonstrated a good response to the capsaicin cream. She was instructed to continue application twice a day for the next 3 days and then decrease it to once a day for 3 weeks. She would be reevaluated in 1 month.

DISCUSSION

Apocrine sweat glands are located in the axillae, anogenital skin, mammary areolae, and over the skin of the trunk, face, and scalp.¹ Apocrine chromhidrosis refers to the secretion of colored sweat by the apocrine glands. Originally believed to be limited to the face or axillae, it can also involve the areolae.² It presents after adrenarche, when secretion from apocrine glands is increased and occurs during exercise or with direct pressure to the glands.³ Axillary apocrine chromhidrosis occurs in 10% of blacks and less often in whites.¹ The disorder is chronic and may slowly regress as the secretion of apocrine glands decreases with age.²

Excluding the case report of a 9-year-old girl diagnosed with red facial pseudochromhidrosis secondary to bacterial infection,⁴ our patient represents the youngest reported case of areolar apocrine chromhidrosis, whether isolated or associated with facial and/or axillary involvement. Apocrine chromhidrosis isolated to the areolae has been reported in only 1 other adolescent female.⁵

Etiology and Diagnosis

It was previously theorized that apocrine chromhidrosis resulted from an increased production of tyrosine, heme, and melanin.⁶ However, it has been

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Fig 1. Left breast.



demonstrated that chromhidrotic apocrine glands have elevated levels of lipofuscins that cannot be explained by dietary or metabolic alterations.^{1,2,6} There are no associated systemic or pathologic findings.² There is no gender, occupational, or geographic predisposition, and apocrine chromhidrosis is not influenced by seasonal or climatic variation.¹

The color of apocrine sweat may be yellow, green, blue, brown, or black due to varying concentrations or oxidation states of the lipofuscin granules. Higher states of oxidation result in a darker color.^{1,2,4,7}

Diagnosis of apocrine chromhidrosis can be confirmed by demonstrating an increased number of lipofuscin granules within chromhidrotic apocrine cells⁴ or by induction of apocrine sweat through emotional, pharmacologic, or mechanical stimulation.² A feeling of warmth or a prickly sensation due to emotional or physical excitation may precede the onset of colored sweat.

Several extrinsic causes may be involved: chromogenic bacteria (eg, *Corynebacterium* species), dyes such as bromophenol blue, and copper salts.⁴ The differential diagnosis includes: hyperbilirubinemia, *Pseudomonas* infection, bleeding diathesis (red sweat, hematohidrosis), alkaptonuria (ochronosis), and poisoning.^{6,8,9}

Wood's lamp examination of colored sweat may be positive. A more refined test involves autofluorescence of clothing fibers in contact with the secretions using a standard UV microscope.¹⁰ A complete blood count to exclude bleeding diathesis and determination of urinary homogentisic acid levels to exclude alkaptonuria may be obtained. Yellow-brown granules may be observed in the apical area of secretory cells on hematoxylin and eosin stain.⁶ The granules are periodic acid-Schiff positive and demonstrate autofluorescence similar to lipofuscins.⁶



Fig 2. Right breast.

Treatment and Management

Patients may become symptom-free after manual or pharmacologic emptying of the glands secondary to depletion of the pigment from the apocrine glands, but the pigment reaccumulates within 48 to 72 hours.¹¹ Successful treatment of apocrine chromhidrosis with capsaicin cream 0.025% was reported in 1989.¹¹ Capsaicin (trans-8-methyl-N-vanillyl-6-nonenamide) is a white crystalline compound obtained from plants of the nightshade family (*Solanum*) and has significant effects on sensory neurons.¹¹ The effects of capsaicin seem to be primarily due to its influence on substance P levels in the unmyelinated, slow-conducting type C sensory fibers.¹¹ Substance P is found in these afferent sensory fibers, dorsal root ganglia, and the dorsal horn of the spinal cord. It is considered the principal pain neurotransmitter for nociceptive impulses from the peripheral nervous system.^{5,11}

Capsaicin seems to deplete and prevent reaccumulation of substance P in peripheral sensory neurons, but there is no evidence that capsaicin affects the motor system.^{5,11} Spontaneous resolution is not usual, and relapse can occur within a few days of discontinuing the medication.¹¹ Potential complications secondary to capsaicin cream include initial local irritation and insensitivity to injurious chemical stimuli.¹¹

Outcome and Prognosis

For apocrine chromhidrosis, there are no known medical sequelae other than embarrassment and the psychologic concerns. The goal of therapy is to reduce secretions, thereby reducing embarrassment. Infections should be treated and patients should be advised to avoid external causes when they are identified. Prognosis is good if an external etiology is determined and corrected. Otherwise, the condition may become chronic. Patient education consists of reassurance if other causes have been excluded.⁶

SUMMARY

Apocrine chromhidrosis may develop at any age and involves primarily the axillae and face. It is observed more often after puberty. Puberty is fre-

quently characterized by many physical and emotional changes. Adolescents may be uncomfortable voluntarily discussing topics perceived to make them different. Whether apocrine chromhidrosis is an uncommon disorder or is simply underreported because patients do not seek assistance remains to be determined.

Axillary chromhidrosis occurs more frequently in blacks than in whites. It manifests as a yellowish staining of the undershirt for which medical care is rarely sought. There may be many undiagnosed patients anxiously waiting for someone to ask them the right questions during a physical examination or office visit. We should begin asking patients questions relevant to this topic. Only then will we be able to diagnose, treat, and document the true incidence of apocrine chromhidrosis.

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