

Argyria Secondary to Systemic and Topical Absorption of Colloidal Silver Through Natural Mineral Supplementation

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Argyria Secondary to Systemic and Topical Absorption of Colloidal Silver Through Natural Mineral Supplementation

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Case Presentation:

Patient: 69 year-old Caucasian female.

History of Present Illness: The patient presents with a six year history of skin dysesthesia and complaint of a substances extruding through the skin. She was noted to have a distinct blue-gray discoloration of the skin on her face and hands. She is self-medicating with an over-the-counter silver supplement called "NutraSilver." The patient has been ingesting the liquid supplement and putting it in her eyes, nose, and ears intermittently for two years. She uses approximately 2-10 drops orally per day.

Medical History/Surgical History:

hypertension, hyperlipidemia, chronic headaches, cholecystectomy, coronary artery disease with coronary artery bypass graft and angioplasty

Social History: Retired office receptionist, married with children, denies current use or history of tobacco, alcohol, or illicit substances

Medications: NutraSilver micro-particle silver water (contains 3600 PPM colloidal silver), amlodipine, propranolol/hydrochlorothiazide, atorvastatin, aspirin, amitriptyline, probiotic supplement

Physical Examination: Examination reveals slate-gray to blue discoloration of the skin most prominent on the forehead, cheeks, and nose with sparing of the periorbital and perinasal skin (Figure 1). The conjunctiva and oral mucosa appear normal in color. The bilateral dorsa of the hands are also blue-gray discolored and lanulae have a faint blue hue (Figure 2). Her hair does not have a silver tinge.

Laboratory Data: BPAg 180, CBC, and CMP were all WNL or negative.

Biopsy: *Advanced Dermatology Associates, LTD* (AD15-15604, 12/30/2015) Left lateral forehead: "Silver deposition (Argyria)- Microscopic brown-black granules stipple the basement



Figure 1: Clinical image of patient's face demonstrating the gray-blue discoloration.



Figure 2: Clinical image of patient's hands demonstrating the faint blue lunulae.

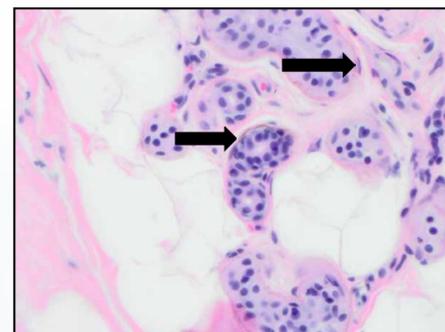


Figure 3: Biopsy from the left lateral forehead: Silver Deposition (Argyria)- Microscopic brown-black granules stipple the basement membrane of sweat glands (Arrows).

Discussion:

Argyria is a well-documented condition due to chronic exposure to products that contain silver. It is characterized by slate-gray or blue dyspigmentation of the skin, conjunctiva, lunulae, hair, and oral mucosa. The most pronounced discoloration occurs in photodistributed areas. The differential diagnosis for argyria is large and includes cyanosis, Addison disease, Wilson disease, hemochromatosis, and methemoglobinemia. Histopathologically, argyria is characterized by multiple dark brown-black granules deposited in a band-like fashion in the basement membrane of the sweat glands. The granules are also found in elastic fibers in the papillary dermis, connective tissue sheaths around pilosebaceous follicles, in the arrector pili muscles, and in arterial walls. There is usually an increase in melanin pigment in the basal layer and increased melanophages in the papillary dermis. Extracellular clusters of granules deposited between collagen fibers have been demonstrated on electron microscopy.

Historically, silver has been used in medicine to treat mental illness, infections, and epilepsy as far back as the eighth century. It is still used today as a cauterizing agent, and an antimicrobial in the treatment of burns. Today the most likely cause of argyria is through ingestion of dietary supplements. Although the Food and Drug Administration banned the use of colloidal silver and silver salts in over-the-counter products in 1999, this ban did not apply to products that are marketed as dietary supplements. The advent of the internet in combination with its accessibility and lack of regulation allowed silver to be marketed as an "alternative health" aide and cure-all for the treatment of cancer, Lyme disease, HIV, arthritis, and Morgellon disease.

It has been shown that at least six grams of silver ingested orally, or one gram of intravenous silver, is required to produce clinically apparent argyria. The mechanism by which the gray-blue cutaneous discoloration occurs is still up for debate. One theory suggests that it is the result of sunlight enhancing the direct stimulation of silver deposits on melanocytes to increase melanin production. Alternatively, some suggest sunlight acts as a catalyst for the reduction of silver within the dermis. Silver can also deposit into other organs such as the eyes, brain, spinal cord, stomach, liver, kidneys, adrenal glands, spleen, and testes. Adverse effects depend on the dose, duration, form, and route of exposure. Silver salts are more toxic than silver proteins and consumption of large doses can result in hemolysis, renal failure, pleural edema, seizures, and coma. Reports of physiologic derangement or organ damage are extremely rare in cases of tissue deposition.

The discoloration of argyria may fade with time if ingestion is ceased, but rarely shows significant improvement. Chelation therapy with British anti-Lewsite (BAL) and D-penicillamine, intralesional therapy with sodium thiosulfate and potassium ferrocyanide, and topical therapy with hydroquinone and dermabrasion have all been tried with little to no success. Q-switched frequency doubled Nd-Yag laser has been shown to be successful in a case report. It is important to always recommend sun avoidance and sunscreens to prevent further pigmentary change.

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