

# What's Causing This Intensely Itchy Rash on a Woman's Lower Extremities?

Christopher Tournade, BS, Syed A. A. Rizvi, PhD, Jasmin Ahmed, BS, Ayman M. Saleh, PhD, and Sultan S. Ahmed, MD

**Case** A 69-year-old woman presented with a chronic, severely pruritic rash that largely affected the lower extremities.

The woman has type 2 diabetes mellitus, hypertension, hyperlipidemia, and end-stage renal disease, the latter for which she had been undergoing dialysis 3 times per week.

Her surgical history was significant for having undergone a left carotid arterectomy in 2000, 4-vessel coronary artery bypass graft surgery (left leg vein graft) in 2000, and right-arm arteriovenous fistula placement in 2009.

**Physical examination.** Vital signs included the following values: blood pressure, 110/58 mm Hg; pulse, 75 beats/min and regular; respiratory rate, 18 breaths/min and regular; temperature, 36.9°C; height 157 cm; weight, 84.4 kg; and body mass index, of 34 kg/m<sup>2</sup>. Examination findings of the head, eyes, and neck were unremarkable, as were cardiac, respiratory, and abdominal examination findings. Neurologic examination was nonfocal, and the patient was alert and oriented to person, place, and time.

A severe rash with diffuse erythema and numerous excoriated, healed lesions was visible bilaterally on her lower extremities (**Photo**).

**Laboratory evaluation.** Blood tests revealed the following values: calcium, 8.8 mg/dL; sodium, 144 mEq/L; potassium, 5 mEq/L; glucose, 108 mg/dL; alkaline phosphatase, 272 U/L; phosphorus, 5.3 mg/dL; albumin, 4.1 g/dL; creatinine, 9 mg/dL; hemoglobin, 11.2 g/dL; hematocrit, 35.6%; iron, 78 µg/dL; total iron-binding capacity, 236 µg/dL; hemoglobin A1C, 7.1%; total cholesterol, 147 mg/dL; low-density lipoprotein, 77 mg/dL; high-density lipoprotein, 47 mg/dL; aspartate aminotransferase, 17 U/L; alanine aminotransferase, 13 U/L; and blood urea nitrogen, 52 mg/dL.

Skin biopsy of the rash demonstrated asteatotic dermatitis. ■

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## What's Your Diagnosis?

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## Answer: Uremic Pruritus

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Skin biopsy of the rash demonstrated asteatotic dermatitis.

Based on the woman's history, physical examination findings, and laboratory test results, she received a diagnosis of uremic pruritus.

**Discussion.** Uremic pruritus is associated with chronic kidney disease. Its prevalence has been estimated to approach 42% among patients undergoing renal dialysis.<sup>1,2</sup>

Uremic pruritus is a complex condition of uncertain etiology with a number of hypothesized contributing factors.<sup>3</sup> Elevated levels of blood urea nitrogen, β<sub>2</sub> microglobulin, calcium, and phosphate have been demonstrated to have an independent association with the development of severe uremic pruritus.<sup>4</sup> Other factors that have been postulated as contributing to the development of uremic pruritus are xerosis<sup>5,6</sup>; pruritogenic substances such as vitamin A, parathyroid hormone, and skin divalent ions<sup>3</sup>; histamine<sup>7</sup>; overactivation of CD4<sup>+</sup> helper T cells<sup>8</sup>; and endogenous opioids.<sup>9</sup> Despite the many postulated theories, no conclusive evidence has been presented to definitively identify a cause of uremic pruritus.

Clinically, uremic pruritus is characterized by a chronic itching in the presence of chronic kidney failure. The pruritus may be generalized or localized and most often affects the abdomen, head, and arms. It often worsens at night, generally is of least severity following dialysis, and peaks in severity 2 days after dialysis.<sup>1</sup> Affected skin may appear normal or may be characterized by conditions such as lichen simplex chronicus, prurigo nodularis, and keratosis pilaris as result of the patient's scratching.<sup>10,11</sup>

Definitive treatment of uremic pruritus in patients with end-stage renal disease is kidney transplantation.<sup>2</sup> The use of other treatments for uremic pruritus are largely empirical without demonstrated efficacy or safety secondary to the poorly understood pathophysiology of the condition.<sup>3</sup> Among these possible treatments are phototherapy, erythropoietin, antihistamines, gabapentin, opioid receptor antagonists, serotonin antagonists, thalidomide, activated charcoal, parathyroidectomy, and topical agents such as emollients and capsaicin.<sup>3</sup>

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Scratches and prurigo nodularis are visible on the lower-extremity skin of a patient with uremic dermatitis.