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# Gabapentin-induced aquagenic wrinkling of the palms

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## Abstract

Aquagenic keratoderma (AK) or aquagenic wrinkling is a rare palmoplantar skin disease. It is sporadic or hereditary condition. It appears in childhood or young adulthood and it is seen as multiple asymptomatic small shiny papules on the peripheral margin of palms and/or soles after submersion in water. The pathogenesis and etiology of ASA remains unclear. Drugs sometimes trigger AK. Herein, we present the case of a 29-year-old man who had begun treatment with gabapentin three weeks before the onset of his cutaneous symptoms.

*Keywords: aquagenic wrinkling, gabapentin*

## Introduction

A 29-year-old man was referred to our outpatient clinic with a whitish discoloration and wrinkling of the palms after sweating or immersion in water for 5-10 minutes. He also had tingling and pruritus. After drying, the skin normalized within 10 minutes. The other cutaneous areas were normal and the other family members were not affected.

On dermatological examination palmar thickening, whitening, wrinkling, or whitish papules were observed within minutes of exposure to water and regressed spontaneously after drying (**Figure 1**). From his medical history, he had begun treatment with gabapentin three weeks ago before his cutaneous symptoms first appeared. The patient did not have a history of hyperhidrosis, atopic diathesis, cystic fibrosis, abnormal scalp hair, or systemic diseases.

The laboratory findings were normal. Based on the patient's history and physical examination, the most



**Figure 1.** Palmar thickening, whitening, wrinkling, or whitish papules after exposure to water.

likely diagnosis was aquagenic wrinkling of the palms/soles (APW).

APW was first described in 1996 by English and McCollough [1]. APW usually affects adolescent and young females but our patient is male [1]. In the literature, except for two families, all the cases were sporadic. Our patient did not have a family history of this condition.

Clinically, it is defined by the onset whitish papules, edema, thickening, and hyperwrinkling with or without desquamation of the palms and/or soles after immersion in water. Erythema is not usually seen. "Hand-in-the-bucket" syndrome, observed after water immersion, is a diagnostic finding [2].

Histopathology is nonspecific. Hyperkeratosis and dilated eccrine ducts may be seen [2].

The etiology of APW is not known. There are some reports about the relationship between APW, cystic fibrosis, and drugs. Garcon-Michel et al. have described the high frequency of APW in 27 patients with cystic fibrosis [3]. There are a few reports about drug-induced cases in the literature. Rofecoxib, celecoxib, aspirin, tobramycin, spironolactone were reported to cause APW [4-7]. Rofecoxib, celecoxib, and aspirin induce symptoms by increasing sodium retention of epidermal cells. In these cases, cyclooxygenase-2 (COX-2) inhibition in epidermal cells is a potential mechanism. APW appeared in one patient who was using spironolactone for PCOS for approximately 2 months. Spironolactone is an aldosterone antagonist and a diuretic. Adrenal steroids have an important role in the regulation of renal COX-2 expression. Spironolactone surrounds mineralocorticoid receptors and causes upregulation of renal cortical COX-2 expression [7].

Gabapentin is an analogue of gamma aminobutyric acid (GABA). It was initially introduced for the therapy of convulsion but later gabapentin became a first-line agent for neuropathic pain management. Gabapentin acts by interacting with the alpha-2-delta-1 subunit of voltage-dependent calcium channels. However, its precise mechanism of action remains unclear. Therefore its effects involve numerous targets requiring further research [8].

Our patient had begun treatment with gabapentin for three weeks for neuropathic pain in his back before his cutaneous symptoms occurred. When gabapentin treatment was withdrawn, the patient lesions showed improvement. This is the first case we are aware of where drug-induced APW occurred without cyclooxygenase-2 (COX-2) inhibition.

The gabapentin pharmaceutical preparation used by our patient contained sodium lauryl sulfate as an excipient. The gabapentin may trigger APW via an unknown mechanism, or the sodium lauryl sulfate may induce APW by increasing sodium retention of epidermal cells. Therefore, further studies and reports are needed to confirm these observations.

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