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Chemical leukoderma following application of transdermal methylphenidate patch

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To the editor

Chemical leukoderma is a chemically-induced acquired hypopigmented dermatosis ¹. We report a case of chemical leukoderma induced by a transdermal methylphenidate medicated patch for the treatment of attention deficit hyperactive disorder (ADHD).

A sixteen-year-old Caucasian male presented with a three-year history of white patches on his bilateral hips that developed shortly after he began using transdermal methylphenidate patches (Daytrana®, Noven Therapeutics, Miami, FL) to treat his ADHD. The patient alternated the patches between his bilateral hips daily, and noted some erythema and itching after application. The patient subsequently developed depigmentation on his bilateral hips, and stated that it was difficult to ascertain if the depigmentation extended beyond the point of patch application, as he did not apply the patch in the exact same location each day. He denied cutaneous involvement elsewhere, denied a personal or family history of vitiligo, and discontinued patch use after one year.

Physical examination revealed symmetric, 10cm by 10cm, well-demarcated depigmented patches on his bilateral hips that accentuated with the Wood's lamp [Fig 1]. Wood's lamp examination did not reveal any other areas of depigmentation on the remainder of his body. A biopsy was obtained from an area bridging normal and affected skin, and Melan-A staining revealed a focal reduction in melanocyte density along the junction in depigmented areas [Fig 2]. As the affected areas were solely limited to the approximate areas where the patient applied methylphenidate and he did not develop vitiligo elsewhere, we determined that the leukoderma was induced by the methylphenidate patch.

ADHD is a common neurobehavioral disorders in children and adolescents, and 66% of patients receive pharmacotherapy for this condition with methylphenidate being the most widely prescribed agent. Methylphenidate was approved in 2006 as a transdermal patch for children aged 6–12 years, and in 2010 for adolescents aged 13–17 years ^{2–3}. Patients are instructed to apply the patch to the hip area for a maximum of nine hours, and to discontinue the medication immediately if there is any redness or itching. Although rare, the only other cutaneous reactions previously reported with the transdermal methylphenidate patch are generalized urticaria, contact dermatitis, and alopecia ⁴. It is unclear which of the agents in

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the patch induced the chemical leukoderma in our patient; likely causes include the polyester/ethylene vinyl acetate laminate film, the acrylic or silicone adhesive, or the methylphenidate itself.

A total of 512,085 prescriptions for the transdermal methylphenidate patch were written in the first year on the market, with an imminent increase in its use due to the recently expanded age indications⁵. While it is conceivable that the patient in this report may develop generalized vitiligo in the future as the observed depigmentation may represent vitiligo induced by a Koebner phenomenon, the fact that his disease was solely localized to the areas of drug application and did not spread elsewhere suggests that the depigmentation was most likely directly related to patch application. As the patch was not applied to the identical location daily, the areas lack the typical angulated appearance of other cases of contact vitiligo. Given the prevalent use of this transdermal patch, we recommend close observation of treated patients to prevent chemical leukoderma.

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Figure 1. Well-demarcated depigmented patches on the patient's (A) bilateral hips. Higher magnification of the depigmented patches on the (B) right and (C) left hip.

Figure 2.

(A) 4x view of skin taken from the edge of the depigmented patch of the patient's left hip demonstrate a focal reduction in the density of epidermal melanocytes (left side of image) with Melan-A immunoperoxidase staining. (B) 10x view with H&E stain demonstrate only minimal focal inflammatory infiltrate.