

Delayed hypersensitivity to topical and systemic corticosteroids

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doi:10.1111/cod.12841

Key words: adverse drug reaction; allergic contact dermatitis; case report; corticosteroids; cross-reactions; systemic allergic dermatitis.

Systemic allergic dermatitis (SAD) comprises a variety of clinical manifestations occurring after systemic exposure to a specific allergen in a sensitized individual. Several cases of SAD caused by topical corticosteroids have been reported after administration of these drugs by the oral, inhalation, parenteral or transmucosal route.

Case Report

A 52-year-old woman presented with a pruritic and generalized symmetrical eruption of 3 days duration after intra-articular administration of 1 ml of triamcinolone

acetonide (40 mg/ml) for trochanteric bursitis (Fig. 1a). She reported similar cutaneous eruptions after the application of several anti-haemorrhoid creams or ointments during the past 2 years.

Patch testing was first conducted with the TRUE Test[®] baseline series on the patient's back; her own products could not be tested, as she had not kept these. According to ICDRG/ESCD criteria (1), patch tests were read on day (D) 2 and D4, and positive reactions to tixocortol 21-pivalate (++), budesonide (++) and hydrocortisone 17-butyrate (+++) were noted; moreover, nickel sulfate and potassium dichromate also gave positive reactions (+). We additionally patch tested with the corticosteroid series CS-1000 from Chemotechnique Diagnostics (Vellinge, Sweden), and this yielded positive reactions to each allergen on D2 and D4 (Table S1), with a 3+ reaction to hydrocortisone 17-butyrate 1.0% in ethanol (Fig. 1b).

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Conflicts of Interest: The authors declare that they have no potential conflicts of interest.

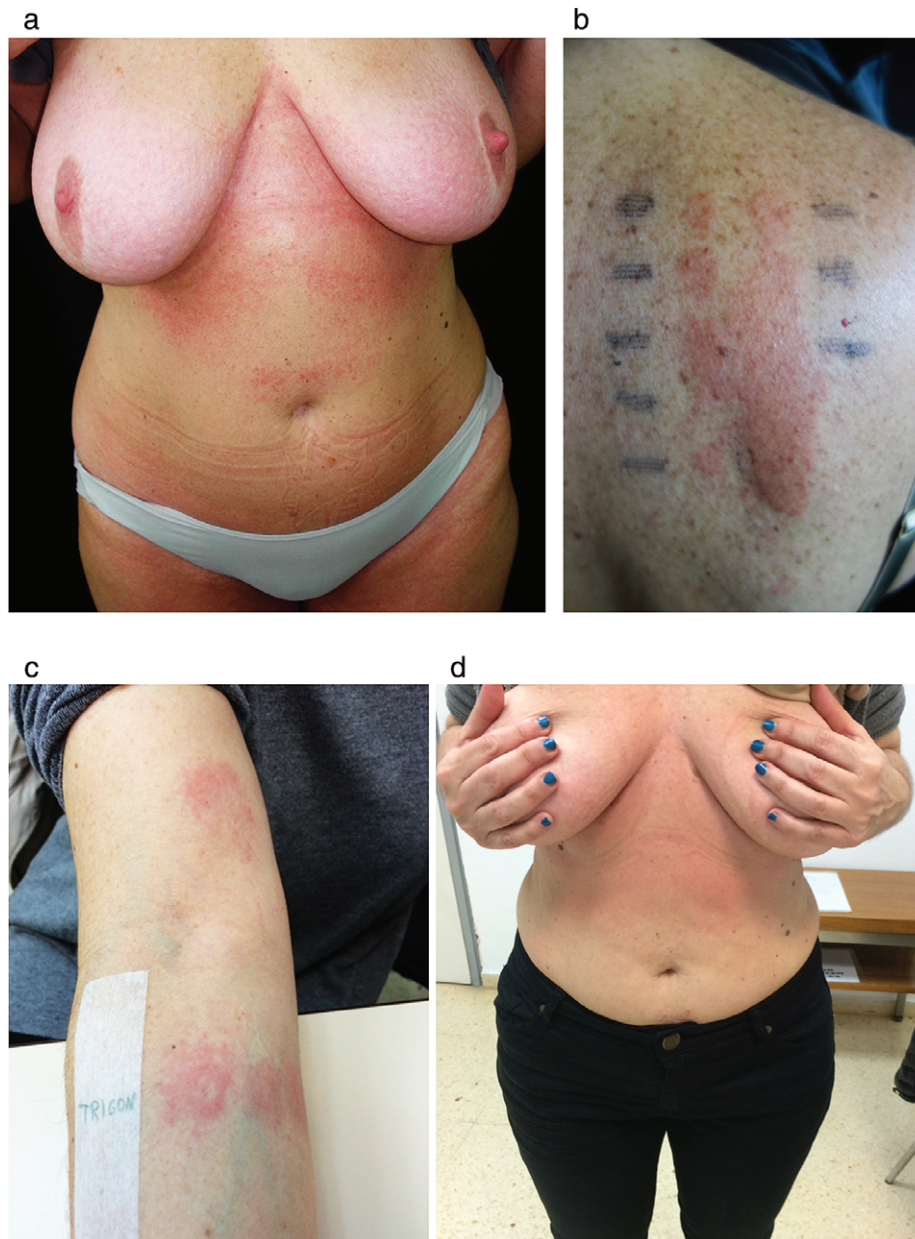


Fig. 1. (a) Skin eruption after intra-articular administration of triamcinolone acetonide. (b) Corticosteroid patch testing. Left column, from top to bottom: budesonide 0.01% pet., betamethasone 17-valerate 1.0% pet., triamcinolone acetonide 0.1% pet., tixocortol 21-pivalate 0.1% pet., and alclometasone 1.0% pet. Right column, from top to bottom: clobetasol 17-propionate 1.0% pet., dexamethasone 21-phosphate 1.0% pet., and hydrocortisone 17-butyrate 1.0% in ethanol. (c) Delayed intradermal test for triamcinolone acetonide. (d) Skin rash after triamcinolone acetonide intradermal test.

Prick testing and intradermal testing were also performed (Table S2). The intradermal test for triamcinolone acetonide gave a delayed positive result, and a similar rash subsequently developed, resembling the initial rash after triamcinolone intra-articular administration (Fig. 1c, d).

Oral challenge tests were performed with deflazacort up to a cumulative dose of 30 mg (i.e. 15 mg, repeated

once after 60 min) and methylprednisolone up to a cumulative dose of 32 mg (i.e. 16 mg, repeated after 60 min); both tests were performed with a 7-day interval. The deflazacort oral challenge test gave a positive result after 14 h, with a pruritic rash on the forearms and anterior chest. The methylprednisolone oral challenge test gave a positive result after 24 h, with a pruritic rash

on the anterior trunk. Subsequently, a hydrocortisone oral challenge test was performed until a cumulative dose of 60 mg was reached, by administering 20 mg every 60 min (this test was performed 7 days after the methylprednisolone challenge), and, 3 weeks later, a challenge test with intramuscular hydrocortisone was performed until a cumulative dose of 200 mg was reached (100 mg, repeated once after 60 min). Both challenges with hydrocortisone gave negative results at immediate and delayed readings (Table S3).

In summary, our patient showed delayed hypersensitivity to topical corticosteroids, with polysensitization to all allergens tested (Table S3), with clinical onset as allergic contact dermatitis, and later-occurring SAD. This patient should avoid the use of topical corticosteroids, use topical calcineurin inhibitors instead, and resort to oral or intramuscular hydrocortisone if needed.

Discussion

Patients who are allergic to corticosteroids are difficult to manage, owing to the high frequency of cross-reactions. The classification of cross-reactions according to Coopman, modified by Matura and Gossens and by Baeck and Gossens (2), helps in the avoidance

of certain corticosteroids, both locally and systemically. However, this classification does not seem to be useful for predicting SAD. Extensive diagnostic approaches are necessary, such as prick tests, intradermal testing, and challenge tests, for assessment of the individual sensitization/tolerance profile (3).

In our patient, we started an oral challenge test with deflazacort, as this has been reported to rarely cause hypersensitivity (4). Some clinicians consider it to be a safe alternative in patients with corticosteroid hypersensitivity, and use it even without a previous oral challenge test. However, our case shows the importance of an exhaustive diagnostic approach in patients with corticosteroid hypersensitivity, which should include confirmation of actual tolerance to a systemic corticosteroid – in our case, hydrocortisone.

Supporting Information

Additional Supporting Information may be found in the online version of this article:

Table S1. Corticosteroid patch testing.

Table S2. Prick test and intradermal testing.

Table S3. Challenge tests performed.

References

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Table S1. Corticosteroid patch testing

Allergens	Day 2	Day 4
Budesonide 0.01 % pet.	+	++
Betamethasone 17-valerate 1.0% pet.	+	++
Triamcinolone acetonide 0.1% pet.	++	++
Tixocortol 21-pivalate 0.1% pet.	+	+
Alclometasone 1.0% pet.	+	+
Clobetasol 17-propionate 1.0% pet.	+	++
Dexamethasone 21-phosphate 1.0% pet.	++	++
Hydrocortisone 17-butyrate 1,0% alc.	+++	+++

Table S2. Prick test and intradermal testing

		Triamcinolone acetoneide 40mg/ml	Triamcinolone acetoneide 4mg/ml	Triamcinolone acetoneide 0,4mg/ml
Prick test		NEGATIVE	ND	ND
Intradermal testing	Inmediate reading	ND	NEGATIVE	NEGATIVE
	Delayed reading	ND	POSITIVE	POSITIVE
		Methyl prednisolone sodium succinate 40mg/ml	Methyl prednisolone sodium succinate 4mg/ml	Methyl prednisolone sodium succinate 0,4mg/ml
Prick test		NEGATIVE	ND	ND
Intradermal testing	Inmediate reading	ND	NEGATIVE	NEGATIVE
	Delayed reading	ND	NEGATIVE	NEGATIVE
ND: not done Inmediate reading: 20 minutes after injection Delayed reading: 48 hours after injection				

Table S3. Challenge tests performed

Challenge test	Immediate Response (60 minutes)	Delayed response (48 hours)
Deflazacort (ORAL) 15mg 15mg (30 mg)*	Negative	POSITIVE
Methylprednisolone (ORAL) 16 mg 16 mg (32 mg)*	Negative	POSITIVE
Hydrocortisone (ORAL) 20 mg 20 mg (40 mg) 20 mg (60 mg)*	Negative	Negative
Hydrocortisone (INTRAMUSCULAR) 100 mg 100 mg (200 mg)*	Negative	Negative
*cumulative dose		

