Propylene glycol allergic contact dermatitis.
A quick reference guide for propylene glycol-free topical corticosteroids in Saudi Arabia

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Propylene glycol (PG) is a chemical used in many products as a solvent, vehicle, humectant, or emulsifier.[1] Propylene glycol was found to be the most common cutaneous allergen in topical corticosteroids (CS).[2] Cosensitization to PG and topical CS can occur,[3] making it challenging to choose the appropriate topical CS in a PG-allergic patient. We recently published an article discussing PG-free topical CS in Canada.[4] The aim of the present article is to provide a guide for dermatologists and non-dermatologists in Saudi Arabia to choose the appropriate topical corticosteroid in patients allergic to PG.

Between August 2012 and July 2013, we carefully searched the ingredients of all topical CS (including the different available formulations) commercially available in Saudi Arabia using the Saudi Food and Drug Authority (SFDA) database and package inserts. Topical CS that contained other active ingredients (for example salicylic acid) were excluded. If a formulation of the same product was listed more than once as different package sizes (for example 30 g cream and 15 g cream), this was counted as one product. A total of 85 topical CS products were identified in the SFDA database. The PG content of 30 (35%) products was unknown due to lack of information regarding the inactive ingredients. Of the remaining 55 products, PG was present in 26 (31% of the total number of products identified). The formulations of the PG-containing topical CS were as follows: 15 creams, 10 ointments, and one lotion. Twenty-nine (34%) of the commercially available topical CS were PG-free. We created a chart containing all the 29 PG-free topical CS available in Saudi Arabia sorted on the basis of their potency and structural class (**Table 1**).

Cutaneous reactions to PG are mostly irritant in nature, but true allergic sensitization does occur. It is challenging to clinically differentiate between irritant and allergic reactions to PG; however, irritant reactions are generally more common, less vesicular, and tend to be associated more with burning sensation than pruritus as compared with allergic reactions. The prevalence of allergic contact dermatitis (ACD) secondary to PG was found to be low (3.5%) by patch

Table 1 - Propylene glycol-free topical corticosteroids available in Saudi Arabia sorted based on their potency and structural class.

Structural class	Class A: Hydrocortisone type	Class B: Triamcinolone acetonide type	Class C: Betamethasone type	Class D1: Betamethasone dipropionate type	Class D2: Methylprednisolone aceponate type
Class 7: Least potent	• Hydrocortisone 1% [C] (Cortiderm®, Riacort®); [O] (Alfacort®, Riacort®)				
Class 6: Low potent					
Class 5: Lower mid-strength				• Betamethasone valerate 0.1% [C] (Betasone, Betaval®, Betnovate®) • Betamethasone valerate 0.1% [S] (Betnovate®)	• Hydrocortisone butyrate 0.1% [C, O, L] (Locoid®)
Class 4: mid-strength				• Mometasone furoate 0.1% [C] (Metaz®)	
Class 3: Upper mid-strength				• Betamethasone valerate 0.1% [O] (Betasone®, Betaval®, Betnovate®, Bevason®, Riavate®) • Betamethasone dipropionate 0.05% [C] (Diprosone®) • Clobetasone butyrate 0.05% [C] (Clobeson®); [C, O] (Eumovate®) • Mometasone furoate 0.1% [O] (Elica®, Metaz®, Zynovate®)	• Methylprednisolone aceponate 0.1% [C, O] (Advantan®)
Class 2: High potent				• Betamethasone dipropionate 0.05% [O] (Diprosone®)	
Class 1: Superpotent				• Clobetasol propionate 0.05% [S] (Dermovate®) • Clobetasol propionate 0.05% [SH] (Etrivex®)	

C - cream, L - lotion, O - ointment, S - solution, SH - shampoo

testing.[3] Topical CS are the second most common source of exposure to PG with a significant number of patients having a concomitant reaction to topical CS and PG.[3] In addition, PG was found to be the most common allergen in topical CS, being present in 64% of the products (mainly in branded ointments and in gels).[2] Topical CS are commonly used in treating many skin conditions. Allergic contact dermatitis to topical CS (or to any of the inactive ingredients such as PG) should be suspected if the dermatitis worsens or does not improve during treatment. The CS are divided on the basis of structure and cross-reactivity pattern into 4 classes: classes A, B, C, and D (subdivided into D1 and D2).[5] There are different screening markers that are used for different corticosteroid classes in patch testing.[5] Patch test reactions to class A CS are the most common followed by classes B and D then class C.[2] Cross-reactions most commonly occur between CS in classes A and D2, followed by classes B and D2.[5]

At least a third of commercially available topical CS in Saudi Arabia contain PG as shown in the present article. Our data suggest that PG is less commonly found in ointments; however, the PG content in 35% of the commercially available products in Saudi Arabia was unknown. Propylene glycol is the most common allergen in topical CS, and cosensitization to PG and topical CS is possible. We recommend prescribing any PG-free topical corticosteroid in cases where patch testing is unavailable, but there is a strong suspicion of PG allergy. Alternatively, tacrolimus ointment can be given as a PG-free steroid-sparing agent (Pimecrolimus 1% cream contains PG). Empirically, one can prescribe a PG-free class D1 topical corticosteroid given that ACD to class D1 topical CS is relatively uncommon. If the clinical picture is suggestive of allergy to PG and/or topical CS, patch testing should ideally be performed. It is important to note that this guide applies only to topical CS products available in Saudi Arabia as products from other countries might contain different non-medicinal ingredients. The main limitation of this study is the unknown PG content of some of the products. We hope that this guide will help physicians in Saudi Arabia to choose the appropriate topical corticosteroid in patients allergic to PG.

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