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# Donkey's milk allergy

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**Introduction**

Donkey's milk allergy is very rare. Donkey's milk is known for its hypoallergenic properties and is therefore frequently used for children with cow's milk allergy.

**Case report**

A 25 years-old woman, with a history of personal atopic dermatitis, allergic asthma and hay fever, experienced a facial angioedema 5 minutes after consuming fresh donkey's milk for the first time (Fig. 1). She developed dyspnea and collapsed after a few minutes. The patient required administration of adrenaline and corticosteroids. During her childhood, her atopic dermatitis was treated with different topical treatments including donkey's milk based emollients. She never presented reactions to this topical treatment and she had no history of food allergy.

Skin prick tests and patch tests with donkey's milk, cow's milk and goat's milk were performed under medical supervision. Skin prick tests read after 20 minutes showed positive reaction for donkey's milk (++) (Fig. 2A). Skin prick tests with cow's milk and goat's milk remained negatives. Additionally, patch tests with donkey's milk were positives at D3 and D4 (D3++/D4++) (Fig. 2B).

Total IgE rate was normal (23 kU/L) and serum-specific IgEs for cow's milk, casein, alpha-lactalbumin and beta-lactoglobulin were negative. Dilution of specific IgE against donkey's milk were not available.

Skin prick and patch tests performed with donkey's milk in 20 control patients showed no sign of irritation.

**Discussion**

Due to its hypoallergenic properties, donkey's milk is proved to be the best alternative in feeding infants affected by cow's milk allergy, since its chemical composition is comparable to human milk. The main allergens in cow's milk are caseins, followed by beta-lactoglobulin and alpha-lactalbumin. The low allergenicity of donkey's milk is mainly due to the low casein content. Donkey's milk is particularly rich in whey proteins [1]. Different authors [2,3] have studied cross-reactivity between cow's milk and other mammalian milk. They showed that cross-reactivities between cow's milk and goat or sheep milk were high, due to the similarity of their protein profiles, unlike mare, camel or donkey milk.

We hypothesized that the patient was percutaneously sensitized through repeated contact of her atopic skin with donkey's milk-based emollients. She subsequently developed immediate hypersensitivity reactions to donkey's milk [4].
Sensitization in food allergy is traditionally thought to occur via the intestinal tract. In recent years, it has been proposed that the primary mechanism for the development of food allergies is epicutaneous sensitization. As a mechanism underlying the development of food allergies, Lack [5] proposed the concept that oral antigen exposure promoted immune tolerance rather than sensitization and that epicutaneous exposure enhanced sensitization.
A combination of type I and type IV hypersensitivities is suggested [6]. We demonstrated the type I hypersensitivity mechanism with the positivity of skin prick test. However, patch test's positivity suggested an associated cellular mechanism. The pathogenesis of food allergy from percutaneous sensitization is yet to be fully elucidated and further examination of additional cases is needed.

Similar cases of immediate reaction secondary to percutaneously sensitization were described with soy-based ingredients in cosmetic products [4], mare's milk-based organic cosmetics [6,7] and oat proteins contained in topical products [8].

In conclusion, this is the first case of donkey's milk allergy reported in the literature. Topical cutaneous use of donkey's milk-based emollients probably leads to sensitization. The patient presented with immediate type clinical symptoms (angioedema) however skin prick tests and patch tests were positives suggesting both type I and type IV reactions were implicated. Donkey's milk is proposed as an alternative in patients with cow's milk allergy. It is also frequently used in topical treatment of atopic dermatitis. Advertised as hypoallergenic, donkey's milk should not be considered constantly safe.

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**Figures**

**Fig 1.** Facial angioedema

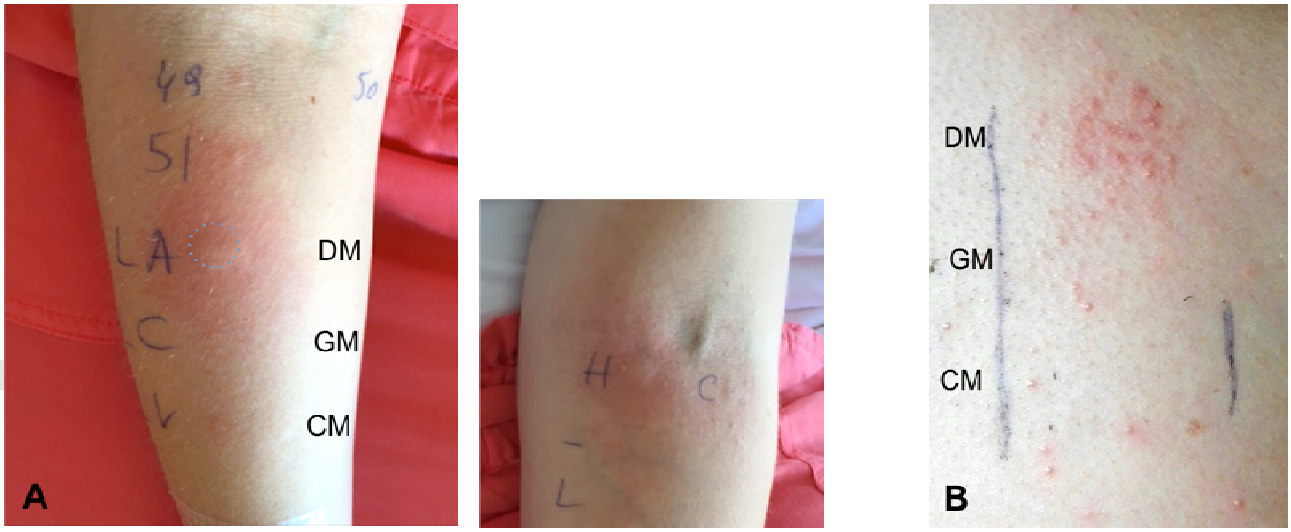


**Fig 2**. A : Positive skin prick test with donkey's milk (DM) (++) and negative skin prick tests with goat's milk (GM) and cow's milk (CM) (results compared to histamine (H) and glycerosaline solution (-)) ; B : Positive patch test with donkey's milk (DM) at D4 (++) (GM: goat's milk; CM: cow's milk).