Instituts thématiques

Inserm

Institut national
de la santé et de la recherche médicale

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Information presse

An antihypertensive drug improves corticosteroid-based skin treatments

Basic research on blood pressure has led researchers from Inserm (Inserm Unit 1138, "Cordeliers Research Centre") to obtain unexpected results: drugs used to treat hypertension (high blood pressure) reduce side effects from corticosteroid-based creams used to treat certain skin diseases.
This work is published in the *Journal of Investigative Dermatology*.

Corticosteroid-based dermatological creams are indicated for the symptomatic treatment of inflammatory skin conditions, such as atopic dermatitis and psoriasis, for example. However, they have frequent side effects, such as a slight burning sensation, and very often end by inducing skin atrophy (thinning of the skin, which becomes fragile), which is inconvenient for the patient, and for which there is presently no treatment.

The researchers from Inserm formulated a hypothesis whereby this harmful effect might be related to the inappropriate activation by these creams of mineralocorticoid receptors located in the epidermis. These receptors, which are present in the kidney, heart, eye, and certain neurons in particular, reacted with aldosterone, a hormone that regulates the blood pressure. Moreover, previous studies also showed them to be highly sensitive to corticosteroids.

Application of corticosteroids to cultured skin causes it to become thinner: in 6 days, the thickness of the epidermis was reduced by one-third. The researchers then induced a pharmacological blockade of the receptors by adding specific antagonists to the corticosteroid treatment. The inability of the corticosteroid to bind to the mineralocorticoid receptors restores proliferation of the epidermal cells, and partially corrects epidermal atrophy.

From the clinical point of view, it turns out that spironolactone, a drug used for a very long time as an antihypertensive drug (and which has marketing authorisation), is an antagonist of the mineralocorticoid receptor. The researchers therefore tested a treatment based on spironolactone for 28 days in 23 healthy volunteers. Creams of different composition were applied to 4 areas of their arms:
- a cream containing a corticosteroid used in dermatology
- a cream containing spironolactone
- a combination of both drugs
- a placebo

The results obtained show that adding spironolactone to the corticosteroid significantly limits skin atrophy.

For Nicolette Farman, *"This is a highly original piece of work, at the crossroads between endocrinology and dermatology, and brings together researchers in basic science and clinicians. Now it remains to reformulate this old drug for a new application, and test this product in patients with various skin diseases in order to confirm the reduction in side effects from corticosteroids without loss of efficacy."*

Sources

Topical mineralocorticoid receptor blockade limits glucocorticoid-induced epidermal atrophy in human skin.

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