

"Brazilian" hair straightening products: risk of acute kidney injury caused by glyoxylic acid



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Following several cases reported in France and other countries, studies have shown that glyoxylic acid can be transformed into calcium oxalate and cause acute kidney injury. In January 2025, ANSES confirmed a highly likely link between this ingredient and this adverse effect, recommending a risk assessment at European level. Pending the introduction of any restrictions, the health authorities recommend avoiding these products and watching out for any unusual symptoms appearing after a hair-straightening procedure.

AN ALERT TO THE COSMETOVIGILANCE SCHEME

In January 2024, ANSES, which had been in charge of the cosmetovigilance scheme since the beginning of that month, received a report from a nephrologist of a case of acute kidney injury supposedly linked to the use of a hair-straightening product.

The report concerned a young woman who had experienced three episodes of acute kidney injury over a three-year period, each time a few hours after having her hair straightened in a hairdressing salon.

The products used for the first two treatments could not be identified, but for the third, a study of its composition showed the presence of glyoxylic acid.

Glyoxylic acid is found in products used for the "Brazilian" hair straightening procedure. It replaces formaldehyde, which was used in cosmetics, particularly hair-straightening products, until 2019. It was then banned due to its classification as a carcinogenic substance in 2014¹ under the European CLP Regulation. Following its ban, the industry developed alternatives, including glyoxylic acid.

SERIOUS ADVERSE EFFECTS THAT ARE ATTRACTING GROWING ATTENTION

Les The nephrologists who treated this patient published their findings in a scientific journal². They established a causal link between the acute kidney injury and the glyoxylic acid, based on observations of the toxic renal effect of glyoxylic acid in mice and similar human cases identified in Israel.

Following this alert, ANSES issued an internal request to carry out a review of knowledge of the renal toxicity of glyoxylic acid in hair-straightening products and to determine whether it was necessary to regulate the conditions of use of this substance.

¹ CLP Regulation <https://eur-lex.europa.eu/legal-content/FR/TXT/PDF/?uri=CELEX:02008R1272-20170101>

² Robert T, Tang E, Kervadec J, Desmons A, Hautem JY, Zaworski J, Daudon M, Letavernier E. 2024b. « Hair-straightening cosmetics containing glyoxylic acid induce crystalline nephropathy ». *Kidney International* 106(6):1117-1123. <https://doi.org/10.1016/j.kint.2024.07.032>.

HEALTH ALERT FOLLOWING NEW CASES IN FRANCE

In August 2024, ANSES was informed of two new reports of acute kidney injury in consumers who had had their hair straightened.

These additional cases led ANSES, the Directorate General for Health (DGS) and the Directorate General for Competition, Consumer Affairs and Fraud Control (DGCCRF) to issue an alert³ in October 2024, without waiting for the publication of the work undertaken by ANSES following the internal request. The priority was to inform the public and healthcare and hairdressing professionals about the serious adverse effects that could occur following the use of hair-straightening products containing glyoxylic acid.

The reports received concerned women aged between 25 and 45 years who had experienced symptoms such as headaches, lower-back pain, abdominal pain, nausea, sweating, discomfort, fatigue, dizziness, vomiting and excessive thirst in the hours following their hair-straightening procedure. Their blood tests showed a significant increase in blood levels of creatinine, a biological marker of kidney injury. No other explanatory cause was found. Progression was favourable in all cases, following oral or intravenous hyperhydration in hospital and a hospital stay of several days in some cases.

ADVICE FOR CONSUMERS AND HEALTHCARE PROFESSIONALS

Do not use hair-straightening products containing glyoxylic acid

In the event of unusual symptoms (lower-back pain, tiredness, nausea, etc.) during application of the product or in the hours following a hair-straightening procedure:

- see a doctor or call a poison control centre⁴, and mention the "Brazilian" hair straightening procedure;
- report the incident on the Ministry of Health's adverse health events reporting portal <https://signalement.social-sante.gouv.fr/>.

FEARS CONFIRMED BY THE SCIENTIFIC LITERATURE

ANSES's analysis of the scientific literature identified data from epidemiological studies establishing a link between the use of hair-straightening products that may contain glyoxylic acid and the occurrence of acute kidney injury within a few hours. These studies suggest that glyoxylic acid, when applied to the scalp, can penetrate the body and be transformed into calcium oxalate. This oxalate can form crystals in the kidneys, leading to potentially severe kidney injury.

An Israeli team identified 26 similar cases occurring between 2019 and 2022. In some of them, renal biopsies revealed the presence of calcium oxalate crystal deposits. Eleven patients were exposed to keratin-based hair-straightening products containing "glycolic acid derivatives" according to the labelling. For the other patients, the type of hair-straightening product used was not identified, but the authors pointed out that the majority of hair-straightening products available on the Israeli market contain glycolic acid derivatives.

In Switzerland, the case of a woman in her forties who developed acute kidney injury after a hair-straightening procedure was published in 2024. The renal biopsy had shown calcium oxalate crystal deposits. The composition of the product used remains unknown.

Lastly, experimental tests carried out on rodents exposed to creams containing glyoxylic acid have confirmed the nephrotoxic role of glyoxylic acid via the skin. Scientific data have also demonstrated the formation of oxalate crystals from glyoxylic acid.

TAKING ACTION TO PROTECT THE PUBLIC, IN FRANCE AND THROUGHOUT THE EUROPEAN UNION

In January 2025, following its analysis of the literature data, ANSES published an opinion⁵ concluding that glyoxylic acid very likely played a causal role in the onset of the acute kidney injury.

The Agency believes that a risk assessment is needed at European level in order to rule on restricting or even banning the use of this substance in hair care products.

ANSES also calls for the recommended risk assessment to examine more broadly the issue of cosmetic substances (found in hair products and other cosmetic products) that can be metabolised into glyoxylic acid, causing kidney effects.

³ <https://www.anses.fr/en/content/warning-risks-hair-straightening-products-containing-glyoxylic-acid>

⁴ Single number +33 (0)1 45 42 59 59

⁵ <https://www.anses.fr/fr/system/files/REACH2024AUTO0079.pdf>

In March 2025, ANSES presented its work to the European Commission's Cosmetics Working Group, bringing together Member States and stakeholders, and requested that glyoxylic acid be assessed by the Scientific Committee on Consumer Safety (SCCS).

CONCLUSION

Pending any regulatory measures and further studies, it is preferable to use hair care products that do not contain glyoxylic acid.

The reported cases highlight the need for increased vigilance when using these products.

The health authorities invite consumers to report any adverse effects associated with these products – and with cosmetics in general – on the adverse event reporting portal of the Ministry of Health⁶. Reporting is essential to better understand the risks and protect consumers.



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⁶ <https://signalement.social-sante.gouv.fr/>