Hydroxycitric acid: new molecular modifier for the prevention and dissolution of kidney stones

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What is hydroxycitric acid?

Hydroxycitric acid is a component present in the dry skin of the *Garcinia cambogia* fruit, a plant that has been used as a dietary supplement for several nutritional purposes.

In 2016, studies were published about its preventive and solvent effect in kidney calcium oxalate stones. The results were promising.

How does it work?

The main mechanism of action of the hydroxycitric is the interaction HCA-crystal by molecular recognition that causes a strong local tension in the crystalline structure motivating its progressive dissolution, a mechanism of action that had not been referred previously. If the structure of the hydroxycitric acid (HCA) is compared with the citrate, the HCA has an additional hydroxyl group. This significantly enhances its efficacy and specificity and contributes to the dissolution of the crystals even in supersaturated solutions and with acid pH.

Does it have proven efficacy?

The Jeffrey D. Rimer group at the University of Houston, in 2016, demonstrated in an *in vitro* study published in the journal *Nature*, that hydroxycitric acid has an inhibitory effect on the growth of calcium oxalate crystals more potent than citrate, and in addition, they were able to verify a solvent effect of hydroxycitric acid on these crystals, which it did not happen with citrate.

This same group, in 2018, it compared *in vitro* the inhibitory effects of hydroxycitrate, citrate and isocitrate on the crystallization of calcium oxalate monohydrate, resulting in hydroxycitrate having a more potent effect than citrate and isocitrate.

The newest of this work is that hydroxycitrate showed an inhibitory effect in human urine superior to what it had shown in previous *in vitro* experimental studies carried out with saline solutions, due to a possible synergistic cooperative effect with other components of the urine.

Subsequent studies by other researchers, some of them with animal experimentation, they have come to corroborate the good results of the Rimer group for both the prevention and dissolution of calcium oxalate stones.

Not only it has been the efficacy with proven for calcium oxalate, but also for calcium phosphate (brushite). In 2018, Meng Li's group studied *in vitro* the growth of calcium phosphate crystals in the presence of citrate and hydroxycitrate. They observed that hydroxycitrate had an inhibitory effect on the growth of these crystals and, in addition, it had a solvent effect even under supersaturation conditions. Growth inhibition and dissolution of brushite crystals with HCA occurred simultaneously.

What advantages does hydroxycitric acid have compared to what is currently used?

Apart from presenting an inhibitory effect on crystals higher than citrate, it also has a solvent effect, even under supersaturation conditions and at acidic pH, which had not been achieved until now.

In addition, HCA has fewer side effects than citrate, with a better tolerance at the gastrointestinal level and it can prevent excessive alkalization of the urine, which prevents the risk of calcium phosphate crystals from forming.

What does the HCA offer compared to other alternatives?

Efficacy and safety. Hydroxycitric acid is postulated as an alternative treatment to citrate, but with greater advantages by having an inhibitory effect on the growth of calcium oxalate crystals more potent than citrate and it has a solvent effect on calcium oxalate and calcium phosphate crystals that it had not been possible to achieve until this moment.

Does hydroxycitric acid have to have any characteristic to be effective?

24-hour continuous release for its short half-life. HCA is a compound of rapid intestinal absorption and that is not metabolized. It being excreted in the urine in significant amounts after oral administration.

For what type of kidney stones is it effective?

For approximately 85% of kidney stones: calcium oxalate, calcium phosphate and those formed by a combination of these. Studies with HCA have been carried out so far in this type of stones.

NEW

COMPLEMENTO NUTRICIONAL

FagolitosPlus®

Natural control of the **kidney stones**

Gluten free
Sucrose free
With sweeteners

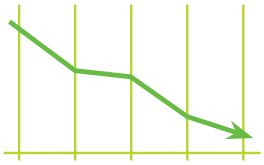
Content of a 1 sachet:

INGREDIENTS	QUANTITY	%DRV
Hydroxycitric acid (Garcinia cambogia extractc)	2069,92 mg	*
Magnesium	200 mg	53
Vitamin B6	25 mg	1786
Zinc	10 mg	100
Vitamin A	800 µg	100

DRV: Dietary Reference Value
*: DRV not established

FagolitosPlus® acts in **85%** patients with **renal lithiasis.**
Avised in:

- patients with calcium oxalate and/or calcium phosphate lithiasis.
- patients with calcium lithiasis who have hyperoxaluria and/or hypomagnesuria.
- patients with presumably calcium lithiasis that do not have a study of calculus composition analysis.



Reduces the production of endogenous oxalate

Reduces the absorption of dietary oxalate and inhibits the formation of crystals of calcium oxalate and/or calcium phosphate

Inhibits the growth of calcium oxalate and/or calcium phosphate stones

Promotes the dissolution of calcium oxalate and/or calcium phosphate stones even in supersaturation conditions and with acidic pH

POSOLOGY:

• In patients with previous episodes of calcium oxalate and/or calcium phosphate lithiasis without current stones .....**1 sachet per day** ✓

• In patients with calcium oxalate and/or calcium phosphate stones currently present ..... **2 sachets per day: 1 in the morning + 1 at night** ✓

Pour the content of an envelope directly into the mouth, in one or several portions and swallow the granulate with the help of a glass of water. **Do not chew.** It can also be dispersed in a yogurt or jelly. Take preferably with food intake. **FagolitosPlus®** contains 1000 mg of potassium per sachet. Caution in renal failure.

CONTAINER CONTENT:

A pack of **FagolitosPlus®** contains 30 sachets of granules.

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