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## **Indigestion remedy significantly slows kidney function decline and improves survival in late-stage CKD**

**As chronic kidney disease (CKD) progresses, the kidneys become less able to maintain a healthy balance of acids in the body, a condition known as metabolic acidosis. To maintain healthy acid levels, people with CKD are treated with alkaline substances such as sodium bicarbonate, also commonly used to neutralize heartburn and indigestion. The UBI study, a large randomized controlled trial, shows that sodium bicarbonate halves the risk of kidney disease progression, the likelihood of starting renal replacement therapy (RRT; dialysis or transplantation) and the overall risk of death in people with CKD [1].**

Defined as serum bicarbonate less than 22 mmol/L [2], metabolic acidosis is common in people with CKD stages 4-5 (eGFR < 30 ml/min/1.73 m<sup>2</sup>) and is directly related to worsening kidney function. Metabolic acidosis is a problem because it is associated with complications such as bone disease, muscle wasting, high levels of blood potassium (hyperkalaemia), insulin resistance, high cholesterol (hyperlipidaemia), and with a more rapid decline in kidney function—shown by rising blood creatinine—and increased risk of death [3].

International guidelines recommend that, when serum bicarbonate concentration falls below 22 mmol/l, CKD patients should be treated with oral sodium bicarbonate to maintain serum bicarbonate within the normal range, unless contraindicated [2]. However, until recently, very few studies have tested the effectiveness of bicarbonate therapy in improving metabolic acidosis or its potential benefits in patients with CKD.

Results of the UBI trial announced for the first time during the ERA-EDTA Congress in Budapest, now provide strong evidence for the benefits of correcting metabolic acidosis with sodium bicarbonate in people with late-stage CKD.

The prospective, open-label, randomized controlled trial assigned 740 patients with CKD-3b and CKD stage 4 to either sodium bicarbonate (376 patients) or standard care without

sodium bicarbonate (364 patients). The patients had a mean age of 67.8 years, creatinine clearance 30 ml/min, and serum bicarbonate 21.5 mmol/l. At the end of three years, doubling of creatinine occurred in significantly fewer patients randomized to sodium bicarbonate: 6.6% versus 17.0% receiving standard care,  $p < 0.001$ . This translates into a relative risk reduction of 64% in kidney disease progression (hazard ratio [HR] 0.36; 95% confidence interval [CI] 0.22-0.58;  $p < 0.001$ ).

Similarly, the likelihood of starting RRT was also significantly lower in the sodium bicarbonate group. At the end of the study, 6.9% of patients receiving sodium bicarbonate had started RRT compared to 12.3% of the standard care group—a relative risk reduction of 50% ( $p = 0.004$ ; HR: 0.5; 95% CI: 0.31-0.81;  $p = 0.005$ ). The risk of death was also significantly lower among sodium bicarbonate-treated patients at 3.1% compared to 6.8 % of the standard care group—a relative risk reduction of 57% ( $p = 0.004$ ; HR 0.43; 95%CI 0.22-0.87;  $p = 0.01$ ). Treatment with sodium bicarbonate was well tolerated, with no significant effects on blood pressure, total body weight or hospitalizations.

“There are relatively few treatments that have been shown to slow progression of CKD. As nephrologist, we have used sodium bicarbonate to correct metabolic acidosis in people with CKD for some time, but definite evidence of benefit has been lacking. Our study shows that this very cost-effective treatment is safe and improves kidney and patient survival,” concluded lead investigator Dr Antonio Bellasi.

[1] Bellasi A, et al. Treatment of metabolic acidosis with sodium bicarbonate delays progression of chronic kidney disease: the UBI study. LBCT Abstract ERA-EDTA Congress 2019, Budapest

[2] KDIGO 2012 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease. Kidney Int Suppl 3(1) January 2013

[3] Ahmed AR, Lappin D. Oral alkali therapy and the management of metabolic acidosis of chronic kidney disease: A narrative literature review. World J Nephrol 2018 0; 7(6): 117–122.

#### **About ERA-EDTA**

With more than 7,000 active members, the ERA-EDTA is one of the biggest nephrology associations worldwide leading European nephrology and one of the most important European Medical Associations. It organises annual congresses and a Scientific Education Interactive Day (SEID), it produces guidelines, it collects data and performs epidemiological studies through its Registry. It supports fellowships and research projects. Its publications are NDT and CKJ (this last journal is Open Access). The ERA-EDTA also has an online Educational platform: the European Nephrology Portal (ENP) which includes NDT-Educational@ENP. The 2020 Congress will be held June 6-9 in Milan (Italy). Visit the booth to receive more information!

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