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The Effect of Oral Sodium Bicarbonate on GFR Decline in Chronic Kidney Disease with Metabolic Acidosis

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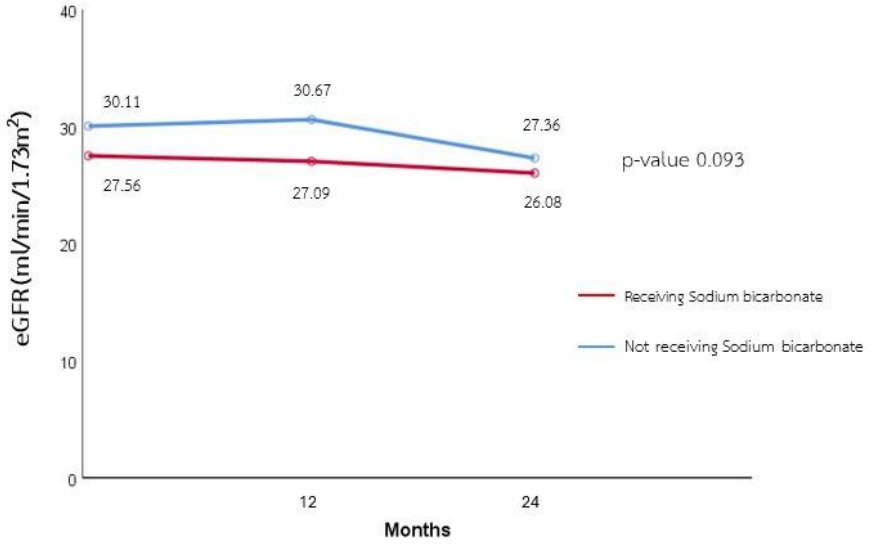
Objectives : Chronic kidney disease (CKD) is a global health problem. Metabolic acidosis accelerates CKD progression, increasing the risk of end-stage kidney disease (ESKD), and mortality. Sodium bicarbonate is commonly used to correct metabolic acidosis, but its impact on kidney function decline remains uncertain. This study aimed to compare kidney function decline in CKD patients with metabolic acidosis receiving sodium bicarbonate versus those not receiving, and identify factors associated with kidney function decline.
Methods : A retrospective cohort study was conducted using medical records from Rajavithi Hospital (January 2019-June 2021). Adult CKD patients (stage 3-4, estimated glomerular filtration rate (eGFR) 15-59 ml/min/1.73m^2) with metabolic acidosis (serum HCO_3 <22 mmol/L) were included. patients with diabetes, systemic lupus erythematosus, or acute kidney injury were excluded. Patients were required to have a follow-up evaluations at 12 and 24 months. Statistical analysis was performed to compare kidney function decline, using SPSS Statistics 26. The study was approved by the ethic committee of Rajavithi Hospital. (IRB no.66098)
Results : A total of 220 patients (52.7% male) with a mean age of 71.8 ± 12.2 years and body mass index (BMI) of 25.2 ± 4.5 kg/m^2 were included. The mean serum bicarbonate level was 20.03 ± 1.32 mEq/L, and the mean eGFR was 30.1 ± 11.1 ml/min/1.73m^2. Patients were divided into two equal groups (n=110) based on sodium bicarbonate use. Overall eGFR decline did not differ between groups; however, patients receiving sodium bicarbonate had a significantly slower rate of GFR decline ($p = 0.001$).
Conclusions : Sodium bicarbonate treatment in CKD patients with mild metabolic acidosis (serum bicarbonate 18–22 mEq/L) does not prevent kidney function decline, but may slow its progression. Further studies are needed to confirm these findings.

Comparing eGFR decline.jpg



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