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Sodium Bicarbonate Supplementation may be Harmful in Septic patients with Severe Lactic Acidosis: a Retrospective Analysis.

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Objectives : Lactic acidosis is a common cause of metabolic acidosis in severely ill patients. Administering sodium bicarbonate may be considered in lactic acidosis patients with arterial pH <7.0, however the effect of sodium bicarbonate on mortality remains controversial. We aimed to evaluate the effect of sodium bicarbonate supplementation on mortality in patients with severe septic lactic acidosis.

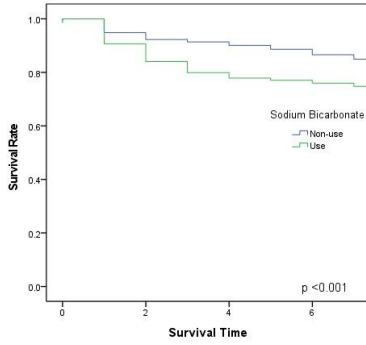
Methods : Single-center analysis was conducted from May 2011 to April 2021 at Dong-A University Hospital, Busan, Korea. We screened 1987 patients with initial pH<7.2, lactate<19.8mg/dL(2.2mmol/L), and positive blood culture. 695 Patients with pCO₂>45mmHg or without follow-up lactate were excluded from the study. We classified 1292 patients into two groups depending on sodium bicarbonate supplementation.

Results : Patients with sodium bicarbonate supplementation was 746 and control group was 545. Mean patient age was 66.8±13.3 years and male was 60.4%. 23.9% had DM and 10.5% had CKD. Sodium bicarbonate group had significantly higher 7-day(25.2% to 15.0%) and 28-day(48.5% to 32.1%) mortality rate compared to control group. More patients were treated with CKRT(continuous kidney replacement therapy), mechanical ventilator, and catecholamine in the sodium bicarbonate group. In the subgroup analysis according to initial arterial pH, the difference of 7-day and 28-day mortality rate between two groups was prominent in the patients below pH<7.0, whereas patients with pH 7.1-7.2 showed no difference of 7-day and 28-day mortality rate. Similar results were shown in the Kaplan-Meier survival curve(Figure 1). Sodium bicarbonate supplementation was associated with 7-day(HR=1.800, p<0.001) and 28-day(HR=1.601, p<0.001) mortality in the Cox regression analysis model including ventilator care, CKRT, and catecholamine administration. In this model, sodium bicarbonate supplementation was only associated with 7-day(HR=2.245, p=0.034) and 28-day(HR=2.285, p=0.004) mortality in patients below pH<7.0.

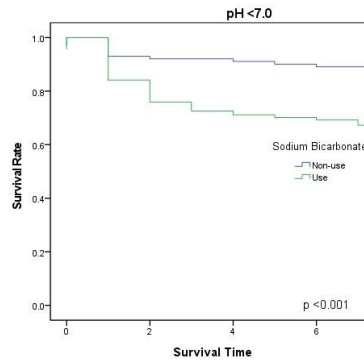
Conclusions : Administering sodium bicarbonate may be harmful in septic patients with severe lactic acidosis. Sodium bicarbonate should be carefully administered in septic lactic acidosis even with pH<7.0.

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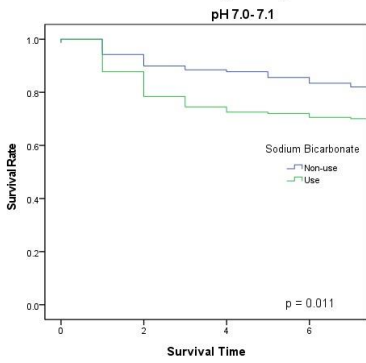
7 Day Mortality



7 Day Mortality



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