

중탄산염으로 치료받은 젖산혈증 환자에서 생존율에 미치는 동맥혈 수소이온지수와 중탄산염 수치 의미

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Effect of Arterial PH and Bicarbonate Level on Survival of Lactic Acidosis Patients Treated with Sodium Bicarbonate: A Retrospective Analysis

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Patients with lactic acidosis have high mortality rate, and higher lactate level is poor prognostic indicator. The correction of lactic acidosis with sodium bicarbonate is potentially harmful when sodium bicarbonate inappropriately was used. Sodium bicarbonate may be considered for an arterial pH <7.1 or <7.2. But it is not clear which starting pH of sodium bicarbonate is beneficial for survival in patients with lactic acidosis. Therefore, we evaluated whether starting pH of sodium bicarbonate affect on the survival in lactic acidosis patients treated with sodium bicarbonate. We conducted a single center analysis from May 2011 through April 2014. We retrospectively analyzed 230 patients with lactic acidosis treated with sodium bicarbonate. Patients were divided four groups according to starting arterial pH of sodium bicarbonate: pH >7.2, 7.1-7.2, 7.0-7.1, <7.0. Multivariate logistic regression analysis was used to identify factors that affect mortality. The mean age of patients was 62.8±15.0 years, 174 patients (75.7%) were died. Of all enrolled patients, 97 (42.2%) patients were died within 48 hours and 109 patients (47.4%) had sepsis. Sepsis is the most common cause of death. The non-survivals had lower albumin, hemoglobin, and CRP levels (p<0.001, p=0.001, p=0.003, respectively), higher SOFA and APACHE II scores (p<0.001, p<0.001, respectively), and higher blood lactate level at 6 hours, 24 hours, 48 hours, and maximum after checking the initial lactic acid levels (p<0.001). The mortality rate was not different according to starting point of sodium bicarbonate: arterial pH >7.2, 7.1-7.2, 7.0-7.1, <7.0. In survival group, arterial bicarbonate level was slowly increased without fluctuation. However, arterial bicarbonate level was increased steeply at 12 hours, decreased at 24 hours and re-increased at 48 hours in non-survival group. The mortality rate was independently associated with arterial pH at 12 hours after sodium bicarbonate infusion. In conclusion, stably increased arterial bicarbonate without fluctuation and recovering arterial pH at 12 hours are important factors in patients survival treated with sodium bicarbonate. Therefore, arterial pH and sodium bicarbonate level should be closely monitored, especially till 48 hours, if sodium bicarbonate treatment is necessary in patients with lactic acidosis.

Key Words: 젖산혈증, 중탄산염, 동맥 수소이온지수
Lactic acidosis, Bicarbonate, Arterial pH