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CCRT 중의 저인산혈증의 발생과 치료

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Hypophosphatemia and Phosphate Supplementation During Continuous Renal Replacement Therapy in Adult

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Purpose: Hypophosphatemia is a common complication of CRRT. We conducted a prospective study to determine the incidence of hypophosphatemia on CRRT in adult patients and to evaluate the efficacy and safety of phosphate supplementation during CRRT.

Materials and Methods: A prospective randomized study was performed in all adult patients admitted to ICU and who underwent CRRT for at least 48 hours. The phosphate, calcium and potassium levels were recorded before CRRT and then every 24 hours after starting CRRT. Hypophosphatemia was defined as serum phosphate level of less than 2.5 mg/dL (mild; 2.0-2.5 mg/dL, moderate; 1.5-2.0 mg/dL, severe; <1.5 mg/dL). All patients were randomly assigned to the P-15.0 group and P-22.5 group. If hypophosphatemia was detected during CRRT, we added phosphate 15.0 mEq or 22.5 mEq to both the replacement solution (5L) and the dialysate solution (5L) in the P-15.0 or P-22.5 group, respectively.

Results: A total of 29 adult patients were enrolled (P-15.0 group, n=16, M:F=6:10, age 66.8±12.0 years; P-22.5 group, n=13, M:F=5:8, age 67.6±9.2 years). During CRRT, 24 patients (82.7%) of patients were found to have hypophosphatemia (mild:moderate:severe hypophosphatemia=51.7%:20.7%:10.3%) and 2 patients (6.8%) had hypophosphatemia at the beginning of therapy. The serum phosphate levels at onset of hypophosphatemia were 2.1±0.4 mg/dL and 2.3±2.1 mg/dL in the P-15.0 group and the P-22.5 group, respectively ($p>0.05$). The onset time of hypophosphatemia after starting CRRT was 52.0±39.2 hours. After adding of phosphate in the replacement and dialysate solutions, hypophosphatemia was rapidley corrected in the P-22.5 group than the P-15.0 group. The durations of hypophosphatemia following phosphate supplementation were 37.7±18.1 hours and 26.7±8.0 hours in the P-15.0 group and the P-22.5 group, respectively ($p=0.030$). Except one patient (3.5%), intravenous phosphate supplementation to correct refractory severe hypophosphatemia was not needed during CRRT. In addition, there were no serious adverse effects after phosphate supplementation.

Conclusion: This results indicated that the incidence of hypophosphatemia in adult on CRRT is very high and that the addition of phosphate, especially 22.5 mEg, to the replacement and dialysate solutions is safe and effective on correcting hypophosphatemia during CRRT.

Key Words: 저인산혈증, 지속성 신대체요법, 인산
Hypophosphatemia, CRRT, Phosphate