

Abstract

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Relation between pyridoxal and pyridoxal phosphate concentrations in plasma, red cells, and white cells in patients with critical illness.

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BACKGROUND: Evidence suggests that the relation between plasma and red cell vitamin B-6 concentrations is perturbed as part of the systemic inflammatory response in critically ill patients.

OBJECTIVE: The aim was to examine the cross-sectional and longitudinal interrelations between pyridoxal (PL) and pyridoxal phosphate (PLP) concentrations in plasma and red and white cells in patients with critical illness.

DESIGN: PLP and PL concentrations were measured by HPLC in plasma and red and white cells in normal subjects (n = 126) and critically ill patients (n = 96) on admission and on follow-up.

RESULTS: On admission, compared with the controls, median plasma PLP and PL ($P < 0.001$ and < 0.01 , respectively) and red cell PLP and PL ($P < 0.001$ and < 0.05 , respectively) and their ratio (PLP:PL) in plasma and red cells ($P < 0.001$ and < 0.01 , respectively) were significantly lower in the critically ill. In critically ill patients, plasma PLP:PL was significantly lower than red cell PLP:PL ($P = 0.001$) and white cell PLP:PL ($P = 0.008$). Plasma PL concentration was directly associated with both red cell PL ($r(s) = 0.73$, $P < 0.001$) and white cell PL ($r(s) = 0.68$, $P < 0.001$). Red cell PL and white cell PL were directly associated with red cell PLP ($r(s) = 0.82$, $P < 0.001$) and white cell PLP ($r(s) = 0.68$, $P < 0.001$), respectively. Longitudinal measurements (n = 48) were similar.

CONCLUSIONS: The relation between plasma PLP and PL was significantly perturbed in critical illness. This effect was less pronounced in red and white cells. Therefore, these results confirm the hypothesis that intracellular PLP concentrations are more likely to be a reliable measure of status than are plasma measurements in the critically ill patient.

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