Dear ladies and gentlemen, dear ADVOS users and interested parties,
we are pleased to present you another issue of our ADVOS Literature Service. We regularly select one or more papers from international journals which might be of interest to you in connection with our ADVOS procedure. This month we have selected the following:

IMPACT OF HYPOPHOSPHATEMIA ON OUTCOME OF PATIENTS IN INTENSIVE CARE UNIT: A RETROSPECTIVE COHORT STUDY.

Wang et al.

Key Message

Hypophosphatemia frequently occurs in Intensive Care Units (ICUs), but its importance is often ignored. The detection of phosphate metabolism abnormalities in ICU populations is crucial. This work shows that hypophosphatemia at admission might be an independent risk factor for 28-day mortality in general ICU patients.

Background

Hypophosphatemia is among the most frequently encountered electrolyte metabolic disturbances in critically ill patients. Since numerous cellular mechanisms require phosphates, when reduced, this can lead to a variety of complications, such as cardiac, respiratory, immunologic, and hematologic disorders. The aim of this study was to investigate whether hypophosphatemia can be a risk factor for ICU 28-day mortality.

Methods

The study was conducted in a cohort of 946 patients, that were divided into a normal control group (serum phosphate levels 0.80–1.60 mmol/L) and a hypophosphatemia group (serum phosphate levels < 0.80 mmol/L), based on the concentration of phosphorus at the time of ICU admission. Patients with hyperphosphatemia (serum phosphate levels > 1.60 mmol/L) were excluded. Among others, data on electrolytes, albumin, mechanical ventilation, renal replacement therapy, ICU length of stay and ICU 28-day mortality were collected. The association between phosphate levels and ICU 28-day mortality was evaluated by binary logistic regression analysis. Multivariate logistic regression was employed to predict the ICU 28-day mortality.

Results

Patients were 62 ± 17 years old; 65.3% were male. Mean age of the patients and sex distribution in the hypophosphatemia group was not significantly different from those in the normal phosphate group. The levels of serum albumin and serum potassium in the hypophosphatemia group were lower than those in the control group, but no difference was detected in the serum calcium, creatinine levels and GFR.

Patients with hypophosphatemia had longer ICU (5.5 vs. 1.7 days) and hospital stays (27.1 vs. 20.6 days). The duration of mechanical ventilation (4.4 vs. 1.2 days) and renal replacement therapy (81 vs. 41 hours) was also longer. Indeed, patients with hypophosphatemia had a higher ICU 28-day mortality than the normal control group (33.3% vs 24.0%, P < 0.05). Moreover, the APACHE II score, male gender, and serum albumin level were associated with ICU 28-day mortality, but age, serum potassium, serum calcium, and creatinine were not.

After adjustment for APACHE II scores, serum albumin and gender, multivariable logistic regression analysis showed that hypophosphatemia was significantly associated with an increased risk of ICU 28-day mortality (OR = 1.5, 95% CI =1.1–2.1, P = 0.01).

	Total	Control	Hypophosphatemia	p
28-day in ICU mortality (%)	284 (30%)	106 (24%)	178 (35.3%)	0.00
ICU LOS (days), median (IQR)	3.4 (1.7, 6.7)	1.7 (1.5, 3.4)	5.5 (2.8, 10.6)	0.00
Hospital LOS (days), median (IQR)	23.5 (13.6, 37.6)	20.6 (12.6, 31.4)	27.1 (15.6, 27.1)	0.00
Proportion of MV (%)	526 (55.6%)	172 (38.9%)	354 (70.23%)	0.00
MV (days), median (IQR)	3 (1, 6.8)	1.2 (0.7, 2.9)	4.4 (2.9, 9)	0.00
Proportion of RRT (%)	133 (14.1%)	39 (8.8%)	94 (18.7%)	0.00
Duration of RRT (h), median (IQR)	66 (35, 141)	41 (22, 59)	81 (45.3, 188.8)	0.03

ICU = intensive care unit; LOS = length of stay; IQR = interquartile ranges; MV = mechanical ventilation; RRT = renal replacement therapy

Table 1: Association of hypophosphatemia with clinical outcomes (adapted)

Die Autoren schlussfolgern:

Hypophosphatemia is an independent indicator of 28-day mortality in the general ICU population. The development of hypophosphatemia should be diagnosed early to prevent its harmful effects.

Unser Kommentar:

Hypophosphatemia is often not diagnosed, because it remains asymptomatic. Phosphate homeostasis is complex, and the phosphate ion may be influenced by other factors, such as decreased renal clearance, increased consumption in catabolic patients, intestinal losses, or clearance over a continuous dialysis. In fact, phosphate replacement is recommended in symptomatic hypophosphatemia and phosphate levels < 0.32 mmol/L. ADVITOS has been aware of this problem. Therefore, our concentrates contain phosphate, so that during dialysis no further decrease occurs. Nevertheless, a close monitoring of the phosphate values should be conducted. In case that hypophosphatemia is suspected, an additional administration of phosphate could be necessary.

If you have further questions or suggestions - please contact us at marketing@advitos.com.