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Changes in serum phosphorus level in patients with severe burns: A prospective study

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ABSTRACT

Background: The second most abundant mineral in the body, phosphorus (P), is absorbed in the small intestine after ingestion enhanced by 1,25-dihydroxy vitamin D, and its excretion is exclusively regulated by the kidney. It is clinically significant, aside from its disturbance in burn ICU patient's P mechanism. The increasing rate of morbidity and mortality among the patients can be associated with severe hypophosphatemia. The current study aimed at investigating the changes in serum P levels in the early period after burns, the relationship between serum P level and TBSA (total body surface area) of burn, and the impact of hypophosphatemia on patients' clinical outcomes.

Material and methods: The current prospective, observational study was conducted on 137 patients hospitalized in the burn intensive unit (BICU) of Velayat Sub-specialty Burn and Plastic Surgery Center from December 2015 to May 2017. According to the TBSA percentage, the patients were divided into three groups. The level of serum P was determined in the 1st, 3rd, 5th, 7th, and 9th days of hospital stay and before discharge. To evaluate the trend of P changes in the sixtime-points, the average changes along with 95% confidence intervals (CI) were used for multivariate analysis of variance with repeated measures (repeated measures ANOVA). A P-value of 0.05 or less was considered statistically significant. The analyses were performed using SPSS software, version 19 (SPSS Inc.).

Results: Totally, 137 patients (70% male, mean age 32 ± 21 years, and TBSA 32.6 ± 14%) were included in the study. The overall incidence of hypophosphatemia was 75.1%. Hypophosphatemia developed as early as 1.66 ± 0.136 (95%CI: 1.4–1.9) days after injury. The highest decrease in the serum P level was observed on the 3rd and 5th days after burn as 2.78 mg/dL and 2.85 mg/dL, respectively (P-value = 0.001). A correlation was observed between TBSA and serum P level. The mean serum P level decreased with increasing the percentage of burns. There was a correlation between serum P level and mortality; therefore, a decrease in serum P level increased the patient's mortality rate ($P < 0.05$).

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