

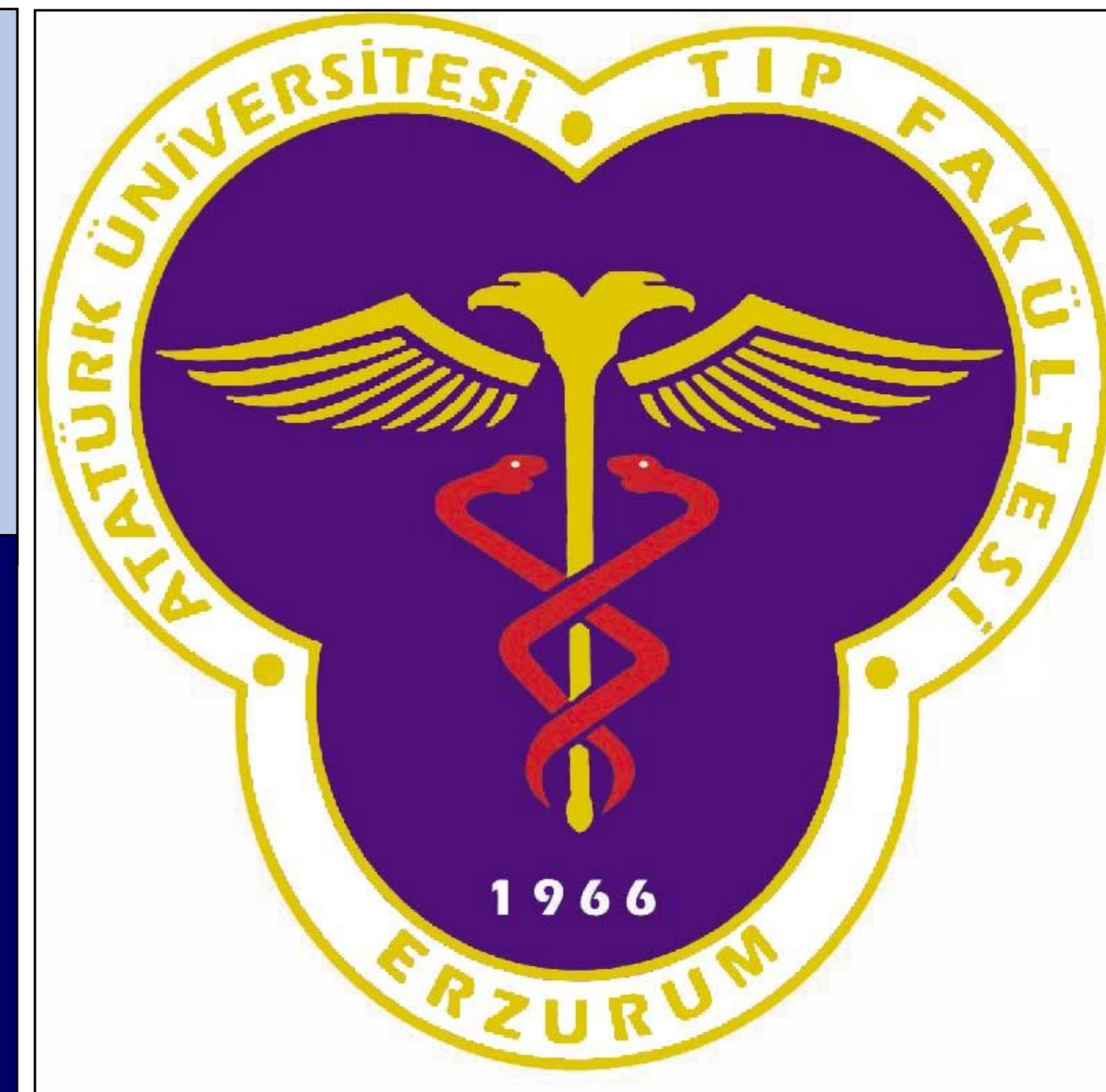


The Effect of Fibroblast Growth Factor 23 on Serum Phosphorus Level in Children with Diabetic Ketoacidosis

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Introduction

- The pathophysiology of developing hypophosphatemia in children with diabetic ketoacidosis (DKA) has not been sufficiently elucidated.
- Fibroblast Growth Factor 23 (FGF23) is a hormone that causes phosphate excretion from the kidneys.
- The increase of FGF23 in children with DKA may explain the pathophysiology of hypophosphatemia in these children.

Material and Methods

- Our study included 30 patients with DKA. Data including age, gender, height and body weight measurements were recorded.
- Blood gas parameters including pH, PCO₂, and HCO₃⁻ and serum BUN level were measured at the beginning of DKA treatment and at the lowest serum phosphorus level.
- Biochemical parameters including serum Cr, Ca, P, Mg, ALP, PTH, intact FGF23 (I-FGF23) and c-terminal FGF23 (C-FGF23) levels and tubular phosphate reabsorption (TPR) ratio were determined at the beginning of DKA treatment, at the lowest serum phosphorus level, and at the time of discharge.

Results

- The study was completed with 18 (%60) old and 12 (%40) new cases.
- The mean age of the patients was 140 ± 57 months.
- The mean serum Cr, Ca, P, Mg and ALP levels at the lowest serum phosphorus level compared to the onset of DKA treatment were significantly decreased (p=0,000, p=0,002, p=0,000, p=0,000 and p=0,000, respectively), while TFR ratio was significantly increased (p=0,000).
- The mean serum Cr level at the time of discharge compared to the lowest serum phosphorus level was significantly decreased (p=0,008), while serum Ca, P, Mg, PTH, I-FGF23 and C-FGF23 levels and TFR ratio were significantly increased (p=0,001, p=0,000, p=0,002, p=0,015, p=0,02, p=0,007 and p=0,001, respectively).
- Serum P level was negatively correlated with pH and HCO₃⁻ levels (r=-0,495; p=0,000 and r=-0,383; p=0,003, respectively), while it was positively correlated with serum BUN, Cr and C-FGF23 levels and TPR ratio (r=0,634; p=0,000, r=0,487; p=0,000, r=0,230; p=0,047, and r=0,528; p=0,000, respectively).
- Serum Mg level was negatively correlated with pH and HCO₃⁻ levels (r=-0,359; p=0,005 and r=-0,236; p=0,05, respectively), while it was positively correlated with serum PTH level (r=0,328; p=0,011).

Conclusion

- The results of our study suggest that the improvement in alkalosis and decrease in TPR ratio during DKA treatment are effective factors in the development of hypophosphatemia, whereas I-FGF23 and C-FGF23 do not have any role in the development of hypophosphatemia.

