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 gase parameters including pH, PCO, and HCO 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 HCO 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 HCO 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.