

## OP-P-04

### PREVALENCE OF HYPOPHOSPHATEMIA IN CHILDREN WITH DIABETIC KETOACIDOSIS

<https://doi.org/10.15605/jafes.037.S2.96>

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#### INTRODUCTION

In diabetic ketoacidosis (DKA), hypophosphatemia may occur due to phosphaturia and intracellular phosphate shift during insulin and fluid repletion. Although ISPAD recommends monitoring, the guideline on routine checks is unclear.

#### METHODOLOGY

This is a retrospective cohort study among children with Type 1 Diabetes Mellitus (T1DM) admitted with DKA from 2017 until 2021 at University Malaya Medical Centre (UMMC). Hypophosphatemia is defined as severe if the serum phosphate is  $<0.80$  mmol/L or moderate if the serum phosphate is between 0.8 to 1.0 mmol/L.

#### RESULTS

Eighty-nine children with T1DM were analysed, but only 47 children with seventy presentations of DKA were included. Thirty (43%) presentations were recurrent DKA (14 patients). Twenty-seven (51%) were males. Forty seven percent (47%) were Malay, 31% Indian, 20% Chinese and 1% were of other ethnicities. There were 47% severe, 36% moderate, and 17% mild DKA presentations. The mean age at T1DM diagnosis was  $8.6 \pm 3.1$  years, and the mean age at DKA diagnosis was  $11 \pm 4$  years. Of the recurrent DKA's, the mean duration of diagnosis was 4.4 years (0.5-8 years). Mean HbA1c was  $12.6 \pm 2.5\%$ . Hypophosphatemia was present in 78% (55/70) [mean  $0.77 \pm 0.4$  mmol/L] with 50% having severe hypophosphatemia (mean serum phosphate of  $0.46 \pm 0.18$  mmol/L). The mean time to onset of hypophosphatemia after DKA presentation was  $12.3 \pm 1.2$  hours. Among the children with severe hypophosphatemia, 74% (26/35) had severe DKA (mean pH  $6.99 \pm 0.13$ ; mean  $\text{HCO}_3^-$   $7 \pm 2.2$  mEq/L). Twenty percent (7/35) were given  $>20$  mL/kg intravenous fluid boluses. Five of 6 children who were on assisted mechanical ventilation had severe hypophosphatemia. Twenty percent (7/35) developed complications with cardiovascular and/or renal injury.

#### CONCLUSION

In our study, the children who presented with severe hypophosphatemia had severe DKA. They also had higher intravenous fluid requirements and higher intubation rates. One in five children with severe hypophosphatemia had other DKA-related complications. Routine phosphate monitoring is recommended in children with DKA.