Diabetic ketoacidosis in adolescents and children: aprospective study of blood versus urine ketones in monitoring therapeutic response

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Abstrak

Background: diabetic ketoacidosis (DKA) is a potentially lethal complication of diabetes mellitus (DM). There is no study in Indonesia that compares the much-preferred capillary beta hydroxybutirate (β-OHB) measurement to urine acetoacetate in monitoring therapeutic response of DKA in adolescents.

Methods: a prospective study of 37 adolescents and children with DKA in Cipto Mangunkusumo Hospital was done between June 2006 and March 2011. The patients were followed until the time of DKA resolution. Hourly measurement of random blood glucose, capillary β-OHB concentration, and urine ketones were done, while blood gas analysis and electrolyte were measured every four hours.

Results: median time to resolution was 21 (9-52) hours. Compared to urine ketones, capillary β-OHB concentration showed stronger correlation with pH (r= -0,52, p= 0,003 vs r= -0,49, p= 0,005) and bicarbonate level (r=-0,60, p=0.000 vs r= -0.48, p=0.007) during the median time of DKA resolution. All capillary β-OHB measurement yielded negative results at median time of DKA resolution, while urine ketones were still detected up to 9 hours after resolution.

Conclusion: blood ketone concentration showed better correlation with pH and bicarbonate level, as a tool to monitor therapeutic response in DKA in adolescent, compared to traditional urine ketones test in adolescents.