Sir,

Ireland is a high incidence country for childhood type 1 diabetes (T1D)\(^1\) and approximately 25% of newly diagnosed children still present in diabetic ketoacidosis (DKA)\(^2\), which is the most common cause of diabetes related deaths predominantly due to cerebral oedema. Correction of acidosis and avoidance of cerebral oedema are the aims of DKA management. Management guidelines allow hospital staff to safely deliver care and compliance with DKA guidelines has been shown to significantly reduce the length of hospital stay, requirement for ICU admission and time to correction of ketoacidosis\(^3\).

Optimal fluid management in DKA in children remains controversial with significant discrepancies in the fluid management guidelines of international expert bodies (BSPED, ISPAD). A large international RCT is currently underway to clarify optimal fluid resuscitation\(^4\). Pending this new evidence base, the National Clinical Programme for Paediatric Diabetes has endorsed continuing with current Irish DKA guidelines.

We undertook an audit of adherence to our DKA guidelines in our institution in 2016. We identified twenty-one patient episodes of DKA, and conducted a retrospective chart review to evaluate adherence to guidelines and clinical outcomes. We found that acute phase management was in line with guidelines in all cases (accurate prompt diagnosis, appropriate laboratory investigations, fluid type, fluid volume and time to insulin infusion from diagnosis). Conservative fluid administration was undertaken with seventeen patients receiving one 10ml/kg bolus, and three patients receiving a further 10ml/kg bolus which was indicated for circulatory shock. Maintenance fluid calculation was accurate in all twenty-one patient episodes. Our guideline recommends that insulin start is deferred for 60 minutes post-fluid initiation and the mean time from commencement of fluids to administration of intravenous insulin infusion was 67 minutes (range 50 – 90). Clinical observations were appropriate in all patient episodes. In fifteen cases (70%), electrolytes and venous blood gases were measured exactly as per guidelines. During sixteen (76%) patient care episodes, dextrose was appropriately added to intravenous fluids but in five patient care episodes, dextrose titration was suboptimal resulting in minor hypoglycaemia in two patients. The mean time to hypoglycaemia from commencement of treatment was 9.7 hours. All patients were reviewed by the diabetes specialist team at admission. No severe hypoglycaemia, hypokalaemia or cerebral oedema was seen during treatment. Median time to discharge home was four days.

The important issue identified by this audit was delay in titrating dextrose concentration in a minority of patients resulting in preventable mild hypoglycaemia during treatment. Guidelines have been updated to make titration steps more explicit to aid interpretation. We are encouraged by the overall excellent adherence to and efficacy of our current Irish DKA guidelines. This supports on going use of same
pending anticipated international RCT data.

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