

Theme: Pediatric Endocrinology

Hypothyroidism after iodine fortification in Denmark (*J Clin Endocr Metab. Epub Dec 2018*)

This 20-year longitudinal study (1997-2016) covering 520,000 population was undertaken in two cohorts in Denmark (Western and Eastern), which had moderate and mild iodine deficiency. Salt iodization was introduced in Denmark in mid-2000. The standardized incidence rate of hypothyroidism in Western and Eastern cohorts increased from baseline rate of 32.9/100,000/year by 150% and 47.3/100,000/year by 130%, respectively. This increase was evident only in young and middle-aged population. This calls for monitoring of thyroid autoimmunity in populations with iodine deficiency when supplemented with iodine.

Is serum bicarbonate better than venous pH to predict recovery in diabetic ketoacidosis? (*J Pediatr Endocrinol Metab. Dec 2018. [Epub ahead of print]*)

Resolution of acidosis is monitored closely in diabetic ketoacidosis following which intravenous (IV) insulin is transited to subcutaneous (SC) insulin. This study evaluated if measurement of serum bicarbonate (target ≥ 15 mmol/L) was better than venous pH (≥ 7.3) to shorten duration of insulin infusion and pediatric intensive care unit (PICU) therapies. Retrospective review of 274 case records of children was performed. Approximately equal number had transited from IV to SC insulin based on serum bicarbonate ($n=132$) and venous pH ($n=142$). The duration of insulin infusion and PICU stay were significantly shorter in bicarbonate group. The adverse events recorded between both groups remained similar.

Dosing of hydrocortisone through nasogastric route (*Clin Endocrinol. 2019;90:66-73*)

Hydrocortisone remains the mainstay of therapy in patients with adrenal insufficiency. Sick children with adrenal insufficiency require hydrocortisone to be administered through nasogastric (NG) tube, the accuracy of which was investigated in this study. Investigators of this *in vitro* study compared hydrocortisone delivery through NG tubes in three forms – liquid suspension, crushed tablets mixed with water and granules suspended in water. Doses of 0.5 mg and 2 mg in 2mL water followed by 2-5 mL flush were tested in NG tubes of 6, 8, 10 and 12 Fr. The drug delivery was collected from the lower end of the NG tube after a waiting time of three minutes as set of six repeated measurements. NG tubes were flushed again if they visibly contained any drug granules along their walls. The quantity of hydrocortisone was measured by liquid chromatography tandem mass spectrometry (LCMS/MS) method. Results showed lower mean concentration of hydrocortisone (for 0.5 mg and 2 mg) at nasal end when given as liquid suspension (57% and 58%), crushed tablets (46% and

30%) and granules (78% and 71%). The drug concentration increased significantly after flushing the syringe at the nasal end. The drug delivery of liquid form of 0.5 mg and 2 mg dose varied from 65-92% and 61-65%, respectively at the gastric end. The delivery of crushed tablets of 0.5 mg and 2 mg were 59% to 174% and 40-96%, respectively (maximum with 12Fr NG tube). Similarly, the drug concentration for granular preparation 0.5 mg and 2 mg were 66-83% and 61-92%, respectively (maximum with 12Fr NG tube). The study highlights the lower dose recovery of hydrocortisone through NG tube unless flushed during administration. The greatest variability was seen with the use of crushed tablets and least with granules. A 12Fr NG delivered the maximum concentration when used as crushed tablet or granule, unlike liquid suspension that was unaffected by tube size.

Targeted next generation sequencing in Maturity onset diabetes of the young (*J Pediatr Endocrinol Metab. Dec 2018. [Epub ahead of print]*)

Maturity onset diabetes of the young (MODY) is a rare hereditary form of diabetes that results from mutations in any of the genes associated with insulin. The present study was undertaken to evaluate the genetic variations in 106 patients with MODY from Turkey using targeted next generation sequencing of *GCK*, *HNF1A*, *HNF4A*, *HNF1B*, *ABCC8*, *INS* and *KCNJ11* genes. The mutation analysis revealed 18 variants, of which 10 were new and eight were previously reported. Among these variants, seven were reported in *GCK*, six in *HNF4A*, four in *HNF1A* and one in *ABCC8* genes. The authors concluded increased frequency of mutations in *GCK* gene other than the usually reported *HNF1A* gene.

Treatment of severe hypercalcemia in vitamin D intoxication (*J Clin Res Pediatr Endocrinol. Nov 2018. Epub ahead of print*)

Vitamin D toxicity with hypercalcemia is a medical emergency. This retrospective study pooled multicenter data regarding clinical characteristics and management strategies using a standardized questionnaire. A total of 74 children (median age 1.06 y) with hypercalcemia (>10.5 mg/dL) associated with vitamin D toxicity (>150 ng/mL) were evaluated. Calcium and 25-hydroxyvitamin D showed weak positive correlation. Mild hypercalcemia responded well to hydration alone. Other modes of treatment included prednisolone, bisphosphonates and a combination of these. A combination therapy was required in severe cases, which needed prednisolone initially. Use of pamidronate reduced the risk of recurrence of hypercalcemia.

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