

Diabetic Ketoacidosis due to Faking of Blood Sugar Measurements by an Adolescent

The current guidelines for care of children and adolescents with Type-1 Diabetes (T1D) recommend a gradual transition of independence in its self management, appropriate to the level of maturity and understanding of the child or adolescent with emphasis on continued parental supervision throughout transition [1]. Lack of parental supervision may result in poor metabolic control or diabetic ketoacidosis (DKA), especially during adolescence.

A 12-year-old boy, diagnosed with T1D one year ago presented with severe DKA (blood pH 6.9, HCO₃ 6.4 mEq/L and positive urine ketones), and required insulin infusion for 16 hours. Due to frequent episodes of 'hypoglycemia', the boy had missed several insulin boluses over last two weeks, and then basal insulin as well for two days prior to presentation. The self-monitored blood glucose diary showed multiple records of blood glucose <50 mg/dL. There were no associated symptoms of hypoglycemia. On suspicion, the glucometer memory was checked that showed almost all records in the range of 250-400 mg/dL in the past 2 weeks; the average blood sugar was 290 mg/dL. The HbA_{1c} was 9.8%. On further probing, it was revealed that the child was allowed independent self-care of his diabetes status by parents, and he recorded blood sugar readings in hypoglycemic ranges to avoid injections without realizing the consequences of missing insulin. A decision to allow only limited self-care autonomy to the child was taken after discussions with parents.

Children develop readiness for diabetes self-management at different rates and at different chronological ages [2]. Parental supervision during transition is associated with better glycemic control, and is instrumental to prevent deterioration in adherence and

mishaps [3,4]. Adolescents, in particular, are at-risk for poor adherence due to unique biological and behavioral challenges during this period [4]. The desire to avoid injections altogether may push an unsupervised adolescent into faking blood sugar records and devising novel ways to fake measurements [5]. While missing the insulin boluses is associated with deterioration in HbA_{1c}, missing the insulin altogether may result in DKA as happened in this patient. Although the blood sugar values could be easily detected to be fake in our patient by a careful history and checking the glucometer memory, a cleverer maneuvering may at times be very difficult to detect [5]. Supervision by parents or caregiver and assessment of readiness for self-care is thus of utmost importance during transition of autonomy of diabetes management in children and adolescents with T1D.

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The Oxygen Blender 'Blunder'

Oxygen is the first drug to be used at birth in the delivery room. It is also the first drug used during care of the sick newborn. Oxygen is hence made readily available and accessible, at all emergency points of care, round the

clock. It is well known that hypoxia is common in sick newborns and an important predictor of outcome. In our zeal to deliver oxygen, we seem to forget that like a drug it has to be delivered in a proper 'dose'.

The oxygen blender is a mixing device that permits mixing of oxygen with compressed air, either from a wall

outlet or from a tank. Resuscitation guidelines recommend that the most appropriate and accurate way to administer oxygen in the delivery room is by use of blender [1]. In preterm infants, it is recommended to initiate positive pressure ventilation with 21-30% oxygen. In response to resuscitation, oxygen needs to be titrated in a graded manner. Blender is required for optimal oxygen delivery, weaning and use of continuous positive airway pressure (CPAP). In absence of oxygen blender, the recommendations are not met and the dose is 'flow' (liters/min) driven which leads to variable and unrestricted oxygen delivery.

Unrestricted use of oxygen leads to hyperoxia, release of oxygen free radicals and oxidative stress causing organ dysfunction, disease and death [2]. Of major concern is retinopathy of prematurity (ROP), which is a leading cause of avoidable blindness in preterm and term infants. WHO has identified ROP as a priority area particularly in the middle income countries [3].

Blender is currently the 'missing link' in provision of quality care for newborns. It is not considered as 'essential' equipment in government supplies, in National Neonatology Forum (NNF) accreditation guidelines, or in neonatal intensive care unit (NICU) equipment procurement list. It is not unusual to see a well equipped, technology driven NICU without a blender. Blenders are

practically non-existent in majority of centers where child-birth occurs, and in nurseries across India. There is a need to train and raise awareness amongst doctors and nurses regarding the danger of treating infants with 100% oxygen. There is an urgent need for innovative blenders for therapeutic use of oxygen. All sick newborn care units must place priority in investing in air-oxygen blenders for regulating oxygen delivery in order to provide rational, ethical and scientific neonatal care.

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An Indian Tool for Assessing Appropriateness of Pediatric Hospitalization

Das, *et al.* [1] published their unique study on a tool for assessing appropriateness of pediatric hospitalization in a recent issue of *Indian Pediatrics*. I seek following clarifications:

- Authors used semi-Delphi technique to arrive at pre-defined objectives. What were the intended objectives/end points of Delphi method?
- What was the method of raters' orientation?
- Authors assessed appropriateness of hospitalization of 274 patients during a period from July-September 2015 from five medical colleges in Delhi and surrounding states. This comes out as 0.6 case/day/medical college. Considering that all these are public

hospitals, number of hospitalizations would have been much higher. What was the sampling method to select only 274 cases?

- Sampling should also have taken account of season when minimum/least number of admission season for better validity and more accurate representative of actual population. There are more chances of appropriateness of admission criteria in peak season than in trough season of admissions. Bianco, *et al.* [2] reported that inappropriate admission was significantly higher if it occurred during the daytime. Considering the circumstances in such hospitals (less chances of follow-up, biased health seeking behavior for male children, distance from home to hospital, availability of night conveyance, ignorance, loss of wages for attending health facility), admission at night time tend to be more inappropriate as compared to day time. Were these factors taken into consideration?
- Sample consisted of 274 patients from Northern India