Highlights

Basal-bolus or premixed? Shedding light on optimal insulin regime for type 1 diabetes

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Abstract

In this issue of the Biomedical Journal, we highlight original research that will help to guide the choice of insulin administration regimes for children with type 1 diabetes. We also investigate whether a common medication for attention deficit/hyperactivity disorder worsens sleep problems among these children, and discover a new approach to maximize the lifetime of a fragile piece of surgical equipment.

Spotlight on original articles

Daily insulin injections are a fact of life for children living with type 1 diabetes (TD1). In this issue of the Biomedical Journal, Chou et al. [1] examine a long history of cases of TD1 to determine whether different injection/dosing regimes influence the risk of developing serious complications of the disease.

Around two in every 1000 children in the developed world are living with TD1 [2]. Different insulin regimes exist for managing the condition, involving injections with various insulin analogs at different times and frequencies. Guidelines from the National Institute for Health and Care (NICE) recommend a basal-bolus type regime, involving insulin injections at each meal to mimic the normal delivery of insulin, coupled with an injection of a longer-acting form of insulin to stabilize blood glucose levels during fasting periods [3]. However, four or more daily injections of insulin can be inconvenient in young children, and other regimes exist to limit this burden. Premixed insulin regimes contain both short and intermediate acting insulin, and as such may be given in only 2–3 injections per day.

One of the most serious complications of TD1 is diabetic ketoacidosis (DKA), which occurs when severe insulin deficiency leads to excessive fat breakdown and the build-up of ketones in the bloodstream. The incidence of DKA in children and young adults is around 5% [4], and the condition may be fatal. Yet, it is not really known whether different regimes of insulin administration affect the incidence of DKA, because the issue is not possible to address in a prospective study. To shed light on the issue, Chou et al. [1] carry out a large retrospective review of patients with TD1 recorded in a Taiwanese registry.

Examining cases from a 14 year period, Chou and colleagues identified 273 young (<20 years old) patients taking a premixed regime and 552 patients taking a basal-bolus regimen. After matching patients for demographic characteristics, each group contained 226 patients. The incidence of DKA was significantly higher in the premixed regime group (10.6%) than in the basal-bolus group (5.3%). In the premixed group, six of these events occurred within the first month of
Ultrasound features to improve diagnosis of wry neck

Torticollis or “wry neck” is a problem of the neck muscles that causes the head to tilt down. When present from birth, the condition is termed congenital muscular torticollis (CMT) and frequently involves the sternocleidomastoid muscle, one of the largest muscles in the neck. It can be categorized into one of four different types on ultrasound, but this diagnosis involves the subjective assessment of images by an expert physician. The analysis performed by Lin et al. [17] in this issue identifies certain quantitative features on ultrasound images that may facilitate the proper, and more objective, classification of CMT.

Testing of a weight control intervention among semi-conductor workers

Lin et al. [18] investigate the effectiveness of a workplace weight control intervention among semi-conductor workers, which due to the stressful nature of their job, are at high risk adverse health effects. In a study involving more than 900 participants, Lin and colleagues find that the combination of both diet and exercise interventions are required to achieve weight loss among such workers, although the effectiveness of these interventions may be limited by alcohol consumption and cigarette smoking.

Maximizing the lifetime of surgical equipment

The introduction of flexible ureteroscopes has marked a new era in urology, enabling kidney stones to be removed without highly invasive surgery. However, flexible ureteroscopes are expensive and prone to damage, and must be repaired as often as every 6–15 procedures [19]. Here, Lin et al. [20] describe a novel operative technique that extends the durability of flexible ureteroscopes to up to 30 procedures before any repair is needed.

Conflict of interests

The author declares no conflict of interests.
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