Aggressive fluid therapy for pain control in pediatric acute pancreatitis: A topic for future research

Dear Editor,

It has been estimated that the incidence of emergency department visits due to acute pancreatitis (AP) in children is roughly 16 per 100,000 [1]. Nearly all of these patients suffer from a severe abdominal pain, which almost always requires prompt intervention. Several pharmacological and non-pharmacological interventions have been developed for diminishing or alleviating acute pain associated with AP. However, most of these interventions are tailored for adult patients and there is a paucity of information regarding the optimal analgesic intervention for pediatric patients suffering from AP in the emergency department. There is a lack of clinical practice guideline for the treatment of pain in this cluster of patients [2,3]. Opioids have an important role in pain control; however, their usage in children is controversial and is associated with major adverse events such as dysfunction of the sphincter of Oddi. Additionally, nonsteroidal anti-inflammatory drugs could not produce long-lasting analgesic effects [4]. Therefore, new effective interventions need to be developed to improve pain control in children.

Intravenous fluid therapy by crystalloid is the foundation of the initial management of AP [5]. Recently, clinical guidelines on AP in adult have focused on aggressive fluid therapy using either lactated Ringer’s solution (LRS) or normal saline solution (NSS) in order to both maintain the adequate arterial pressure to prevent organ hypoperfusion and lower the level of inflammatory mediators, which are supposed to be as a main trigger of systemic inflammatory response syndrome [5,6]. A recent systematic review has shown that LRS may have more anti-inflamatory effects than those of NSS [6]; nevertheless, in the latest American Gastroenterological Association guideline on initial management of acute pancreatitis, the superiority between the use of normal saline and Ringer’s lactate has not been determined that one of the reasons for this is due to the lack of reliable evidence [5].

The aggressive fluid therapy for acute pancreatitis in pediatric patients in the emergency department has many challenges. There is no specialized clinical guideline for usage of aggressive fluid therapy in pediatric patients, and most of the current treatments are based on the adult population. In addition, potential clinical advantages of aggressive fluid therapy with LRS over NSS in pediatric patients are unclear and in need of further research [3]. Moreover, different definitions have been used for the rate of aggressive fluid infusion in studies. Conventionally, it is defined as a rate of 1.5–2 times the maintenance rate [2,3], but it ranges from 1.5 to 3 mL/kg/h along with 20–30 mL/kg bolus [7]. Furthermore, regarding the pediatric patients, no studies compare the initial resuscitation volumes and currently, the ideal rate of fluid administration is unclear [3].

Based on the available evidence in adult patients, it can be assumed that aggressive fluid therapy with or without pharmacological therapy may be helpful to lower the severity of abdominal pain in pediatric patients who suffer from AP, referring to the emergency department. However, at least three questions remain to be answered regarding pediatric patients. What is the best solution for aggressive infusion? What is the ideal volume for initial fluid resuscitation? Moreover, what is the ideal rate of fluid administration that is defined as aggressive? Further prospective clinical trials are needed to test this assumption and to answer these questions.

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