

# Gradual sucrose gastric loading test: Does it really matter?

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Measuring gastric residual volume (GRV) is a standard practice during enteral nutrition (EN) in the Intensive Care Units (ICU). However this practice though customary is marred due to several postulations. It is assumed that GRVs in critically ill patients is a well-standardized practice, GRVs consistently and precisely measures gastric contents, they adequately indicate normal from abnormal emptying. A host of intraluminal and extraluminal causes influences gastric emptying (GE), which may be endogenous or exogenous, and can be modulated by neural and hormonal factors. Factors that may alter GE include osmolarity, volume of feeds, composition of feeds, caloric density, temperature, nature of nutrients, and systemic parameters such as blood sugar levels.<sup>[1]</sup> The definition of “high” GRV is extremely variable. One survey revealed that GRV definitions ranged from values as low as 50–400 mL.<sup>[2]</sup> The assumption that high GRV is synonymous in delayed GE is not well supported by evidence.<sup>[3]</sup> In critically ill patients specified groups are more likely to have delayed GE, these include patients with multitrauma (60%), traumatic brain injury (57%) and sepsis (42%).<sup>[4]</sup> Feeding intolerance is also related to the severity of illness. Opioids and catecholamines that are widely used in the critically ill will influence GE. A protocol of EN management without GRV monitoring is not inferior to a similar protocol, including GRV monitoring in terms of protection against ventilator associated pneumonia as demonstrated by the CRICS study.<sup>[5]</sup> Other methods of determining GE is Scintigraphy (which is considered to be a gold standard consists of recording GE by a  $\gamma$ -scintillation camera), paracetamol absorption test (since paracetamol is not absorbed in the stomach), breath tests using nonradioactive isotope, carbon-13 ( $^{13}\text{C}$ ),

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refractometry (model requires measurement of the Brix value), ultrasound to measure cross-sectional scans of a defined portion of the stomach, Gastric impedance monitoring is based on modifications of electrical resistivity (or impedance) for the estimation of GE and using magnetic resonance imaging. Most of these methods may not be practical to implement in the critically ill.<sup>[6]</sup>

Sucrose or table sugar is essentially cane or beet sugar and is essentially a disaccharide consisting of two monosaccharide glucose and fructose. In critical illness, the measurement of absorption of monosaccharides does not require complex digestion and absorptive procedures. In the critically ill glucose absorption is reduced, this is not only due to delayed GE, but may also be from intestinal factors, most of which is not fully understood.<sup>[7]</sup>

In the current study,<sup>[8]</sup> the authors as per the study protocol included patients in a surgical ICU (SICU) who required mechanical ventilation for over 3 days. In these patients, though APACHE II scores are documented, there are no SOFA scores or data on sedation, opioids and muscle relaxations. The protocol used where by SICU nurses gradually fed 800 mL of 12.5% sucrose (12.5 g of sucrose per 100 mL; 450 m osmol/L) over 30 min via NG or OG (14 French) by feeding pump, is debatable and questionable. Enteral tube feeds can be administered by

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bolus, or by intermittent or continuous infusion. The guidelines of the British Society of Gastroenterology and endorsed by British Association of Parenteral and Enteral Nutrition states that bolus feeding involves administration of 200–400 ml of feed through a feeding tube over 15–60 min at routine intervals. This practice may cause bloating and diarrhea and bolus delivery into the jejunum can cause a “dumping” type syndrome and should hence be avoided.<sup>[9]</sup> In general, critically ill patients do not tolerate large volumes of feeds during initiation of enteral feeding. Such practice of large fluid loading in mechanically ventilated patients is unheard of, and one wonders how this went through the ethics committee. The saline load test – a bedside evaluation of gastric retention quoted in their bibliography, based on which this study was probably designed is over 50 years old.<sup>[10]</sup> About 6% of the patients were diabetics, considering high carbohydrate dose was to be administered to these patients; the authors should have excluded diabetics from this study. With these limitations and considering the fact that this is a single center study, one wonders how such an intervention can ever be implemented in clinical practice?

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