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Gastric ultrasound as an aspiration risk assessment tool

We read with interest two publications in the *Indian Journal of Anaesthesia* that used gastric ultrasound (GUS) to preoperatively assess gastric contents and residual gastric volumes (RGVs) in fasted adult surgical patients.^[1,2] GUS is used increasingly as an aspiration risk assessment tool and we congratulate the authors for their respective contributions. However, we are concerned about the internal and external validity of both studies for the following reasons given below.

Previous literature suggests a high aspiration risk when GUS demonstrates the presence of (a) solid gastric contents, (b) an estimated total gastric fluid volume >1.5 mL/kg which is calculated using a mathematical model with patients being in the right lateral decubitus position and (c) the ultrasonographic presence of clear fluids in both the supine and lateral decubitus positions (Perlas grade 2 antrum).^[3] Two previous studies in a large group of patients have reported that 5%–6.2% of fasted surgical adult patients present with solid gastric contents, RGV >1.5 mL or a Perlas grade 2 ($n = 538$ and 440, respectively).^[4,5]

Both the current articles, however, reported the presence of RGV >1.5 mL/kg or solid contents in 22% and 28% of patients, respectively.^[1,2] These very high numbers are in contrast to the much lower above-mentioned percentages.^[4,5] However, the authors of the current studies failed to mention previous literature,^[4,5] and also did not address this difference in their discussion. Additionally, G Sharma *et al.*^[2] performed the calculation of fluid volumes in the supine position though the mathematical model they used has not been validated and therefore cannot be used for this position.^[3] They also described the initial help of a radiologist to confirm their findings for the first 20 cases which they deemed sufficient to continue

on their own, while a performance of 33 examinations under supervision has been reported to achieve a 95% success rate in bedside qualitative assessment.^[3]

Furthermore, G Sharma *et al.* described the presence of antral fluid in the supine position in 82% of patients.^[2] This presence of fluid in the supine position automatically implicates the presence of fluid in the right lateral decubitus and is consistent with a Perlas grade 2 although they did not use the Perlas grading system. This is an exceptionally large number of elective patients compared with the existing literature that reports a 3%–5% average of a Perlas grade 2 in elective patients.^[3-5] On the other hand, the authors described that 8%–18% of their patients had an RGV >80 mL, whereas it has been consistently proved that 75% of grade 2 patients have RGV >100 mL.^[3,6] These conflicting results need further clarification.

Finally, both the articles reported a statistically significant relationship between RGV and comorbidities such as chronic kidney disease and gastroesophageal reflux disease (GERD),^[1,2] without defining chronic kidney disease (mild stage, end-stage) or GERD (which could be considered when reflux has been investigated, treated or both, with or without hiatal hernia). There was no record of the exact number of patients with chronic kidney disease nor of the number of patients with GERD with GRV $>$ or <1.5 mL/kg. Yet, existing literature again failed to show any association between GERD or chronic kidney disease and increased RGV, but this is not mentioned nor addressed by the authors.^[4,5]

Hence, we think that the results of these studies should be interpreted in light of these concerns. Nevertheless, these articles emphasise that gastric content volume may not always be predictable, even in elective

patients, and that the ultrasound examination of the gastric antrum may provide valuable information, provided that a standardised, reproducible and rigorous method is applied.

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Conflicts of interest

There are no conflicts of interest.

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