Method to assess gastric emptying in the fed state in enterally tube fed patients: comparison of the paracetamol absorption test to scintigraphy

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Introduction:
The paracetamol absorption test (PAT) is the most common and practical approach for assessing gastric emptying (GE) in critically ill patients. However, current methods require that paracetamol be administered to an empty stomach, removing gastric contents and depriving patients of feeding for several hours. The objective of this study was to develop methods to assess gastric emptying in these patients without interrupting feeding.

Methods:
Gastric emptying was assessed in the fed state using PAT and scintigraphy in 12 healthy volunteers. Paracetamol 1g in 30mL was ingested immediately before consumption of a test meal of 250mL Ensure Plus containing 375kcal, 15.6g protein, and 12.3g fat plus 4mBq of 99mTc-DPTA as a scintigraphic agent. Comparisons were made between paracetamol absorption and the time to 25% and 50% gastric emptying by scintigraphy at baseline and after administration of ulimorelin 600µg/kg, a prokinetic agent known to enhance gastric emptying. Blood samples for paracetamol were collected for up to 4h post administration. Values for normal gastric emptying were based on the 95% confidence intervals for PK parameters. Sensitivity and specificity were assessed by receiver operating characteristic (ROC) analysis before and after treatment.

Results:
The PAT correlated with scintigraphy and PK parameters for normal emptying were determined. Cmax and AUC2 were the most sensitive and specific parameters for assessing GE with lowest variability and areas under the ROC curve of 0.8981 and 0.8889, respectively. A 2h sampling period appeared sufficient to distinguish normal from abnormal emptying.

Conclusion:
The PAT can be used to distinguish normal versus abnormal GE in the fed state. Under the conditions used, patients can receive up to 250mL enteral feeding over a 2h test period (125 mL/hr). This method can be used to distinguish normal from abnormal gastric emptying in enterally tube fed patients without interrupting feedings.