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Enteral cisapride, erythromycin, and metoclopramide in critically ill patients intolerant to enteral nutrition: a randomized, placebocontrolled, cross-over study

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Purpose: To evaluate the comparative efficacies of enteral cisapride (CIS), erythromycin (ERY), metoclopramide (MET), and placebo (PLA) for promotion of gastric emptying in critically ill patients intolerant to gastric enteral nutrition (EN).

Methods: Ten critically ill patients with an aspirated gastric residual volume (GRV) greater than 150 ml receiving EN were administered a single enteral dose of CIS 10 mg, ERY 200 mg, MET 10 mg, and PLA (water) every 12 hours in a randomized, cross-over manner. Acetaminophen solution (1 g) was administered concurrently with each dose to evaluate gastric emptying. GRVs were assessed and plasma acetaminophen concentrations were serially determined by TDx between 0 and 12 hours. Compartmental pharmacokinetic methods were used to calculate absorption lag time (thg), mean residence time of absorption (MRTabs), time to peak concentration (tP), elimination rate constant (k), and area under the plasma concentration- time curve (AUC). Statistical analysis included ANOVA and post hoc comparison using Fisher's LSD.

Results: GRVs during the study were not significantly different between agents. Pharmacokinetic parameters (mean ± SD) varied as follows:

Agent (n)	tLag (min)	MRTabs (min)	tP (min)	k (1/min × 10^{-2})	AUC (mg/L/min)
CIS (6)	20.8 ± 16.5	4.6 ± 3.6*	23.1 ± 0.6*+	0.766 ± 0.493	1774 ± 1190
ERY (8)	13.1 ± 18.3	28.1 ± 26.6	65.2 ± 26.8	0.839 ± 0.539	2306 ± 1253
MET (8)	7.9 ± 14.6	8.6 ± 12.7*	39.8 ± 9.8*+	0.847 ± .0451	2255 ± 1472
PLA (8)	12.5 ± 18.1	20.5 ± 17.8	69.2 ± 13.4	0.650 ± 0.230	2582 ± 1586

*$p < 0.05$ versus ERY; +$p < 0.05$ versus PLA

Conclusions: In critically ill patients intolerant to enteral nutrition, a single enteral dose of cisapride or metoclopramide significantly accelerated gastric emptying compared to erythromycin and placebo. Erythromycin provided no advantage over placebo.