

Introduction

- Feeding intolerance is a common cause of hospitalization in infants and toddlers and often requires nasogastric tube feeding.
- Decisions regarding enteral feed administration and advancement are often based on clinical judgment rather than objective data, potentially prolonging hospital stays and increasing costs.
- This study evaluated how the use of “smart” nasogastric tubes with impedance sensors measuring reflux impacts clinical management.

Methods

- Prospective inpatient recruitment of children requiring NG tube placement who elected to use a smart NG tube (Gravitas Tube).
- Reflux episodes per hour and reflux bolus clearance time per patient were calculated and graphed over time.
- Reflux metrics were compared between patients receiving and not receiving anti-reflux formula or prokinetic medications.
- Relationships between reflux monitoring data and clinical outcomes were assessed.

Results

- 20 children were recruited (mean age: 22±16 months).
- Median length of hospitalization was 8 days (range 1-193 days).
- Average length of recording with gravitas tube in place was 55±37 hours.
- Mean number of reflux episodes per patient was 4.2±1.5 and the mean duration of each reflux episode was 11±1.5 seconds.
- There was a significant variation in the number of reflux episodes per feed per patients, but pooled patient data demonstrated a gradual reduction in reflux episodes within two hours after a feed (**Figure 1**).
- There were no differences in the mean number of reflux episodes in patients on antireflux formula (3.4±1.4 reflux episodes per hour) compared to standard formulas (p=3.1±1.8 reflux episodes per hour, p=0.7, **Figure 2A**).
- Patients taking motility medications (erythromycin, prucalopride) had fewer reflux episodes (3.96±1.55 reflux episodes per hour) than those without (4.6±1.59 reflux episodes per hour, **Figure 2B**) but the difference was not statistically significant (p=0.4).
- There were no differences in the number of patients on a PPI, H2 Blocker, or motility medication before or after gravitas tube placement (p>0.3).
- After excluding 2 outliers who were in the hospital for >30 days, the number of days in the hospital was reduced after the NG tube was used compared to before the tube was used by approximately 2.7 days (p=0.17).
- There was a significant reduction in admissions per patient in the 6 months after gravitas placement (0.8±0.8) compared to the 6 months before tube placement (2.1±1.4, p=0.003).

Conclusions

Continuous monitoring of reflux episodes while NG feeding may provide additional data for the team to guide management of feeds. The data gleaned may be helpful in reducing future hospitalizations and escalation of reflux interventions.

Figure 1: Pooled data showing rates of reflux per hour during and immediately after feeds.

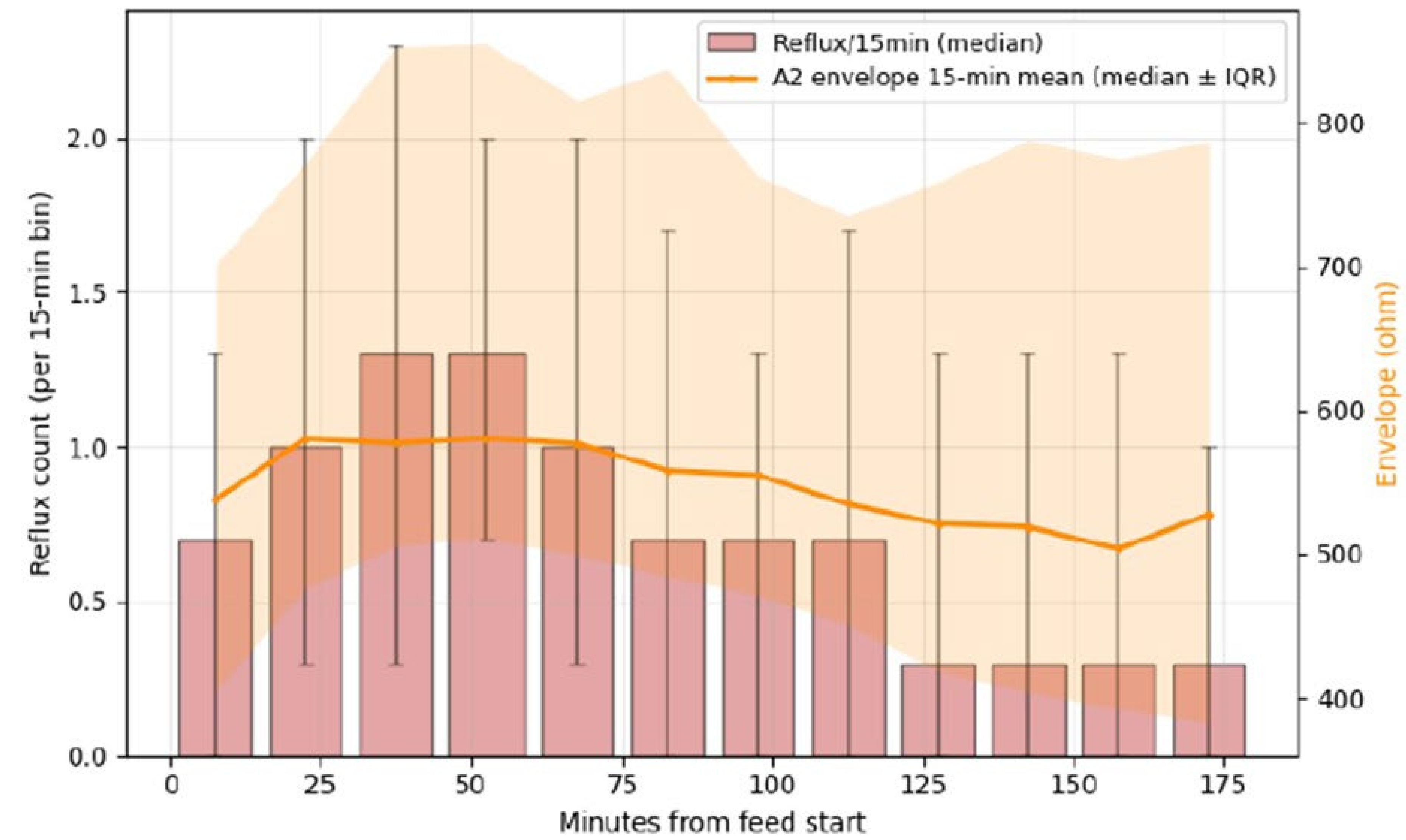
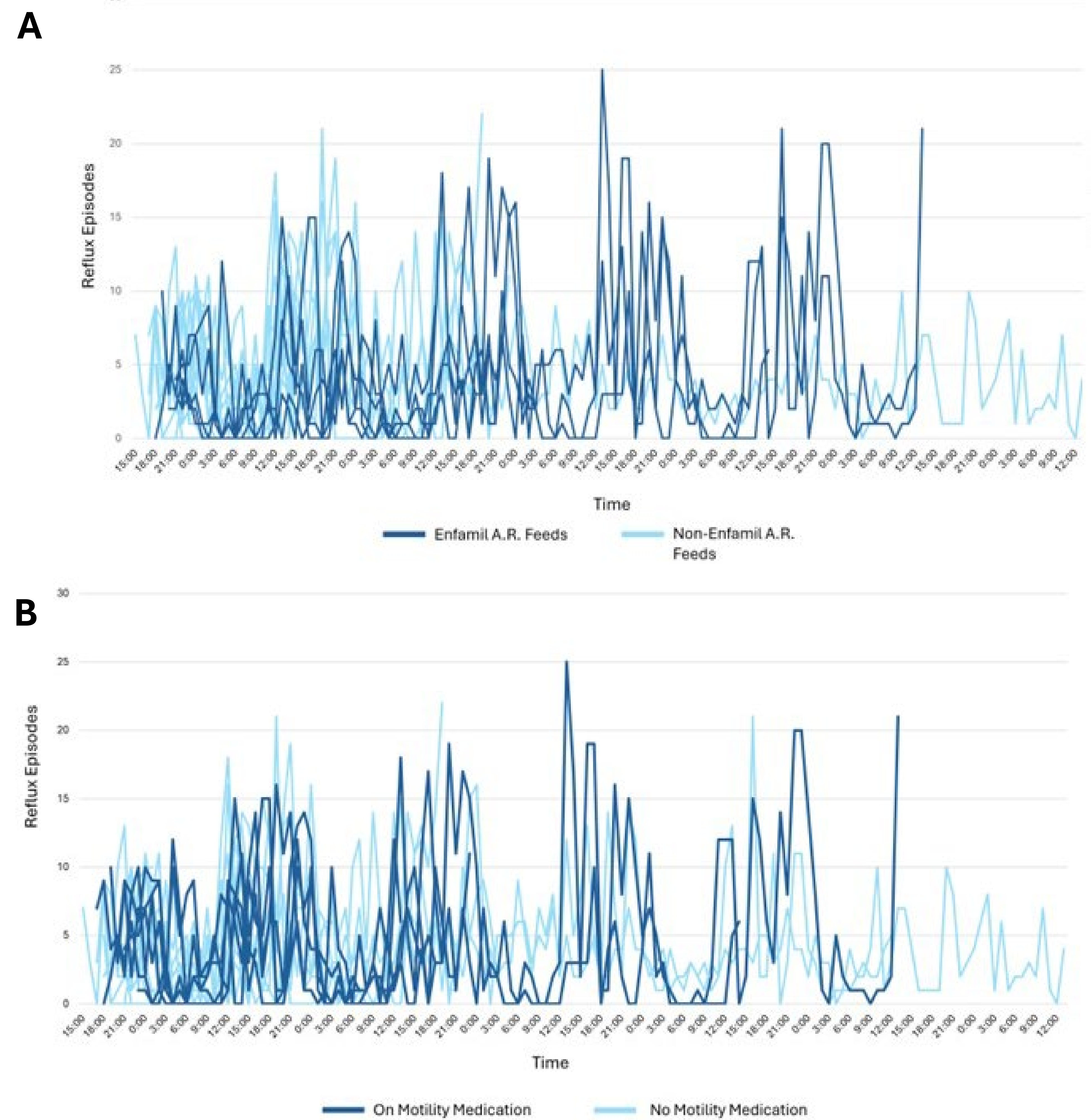


Figure 2: Relationship between formula type (A) and motility use (B) and number of reflux episodes per hour.



Each line represents a patient’s reflux data over time. Dark lines represent patients receiving the reflux therapy (either Enfamil AR (A) or a motility medication (B)).