A Method To Identify Susceptibility for NEC in Preterm Infants

Puneet Jairath, Kim Doheny, Charles Palmer. Division of Newborn Medicine, Penn State Hershey Children’s Hospital, Hershey, PA; College of Medicine, The Pennsylvania State University, Hershey, PA.

BACKGROUND: NEC occurs in 5-10% of preterm infants. The onset is often sudden in otherwise well appearing infants. A modality to screen for NEC risk would be clinically valuable. In a pilot study (n = 30) we found that vagal tone measured by the high frequency (HF) power component of heart rate variability (HRV) on DOL 5-7 was associated with NEC onset 0.5-12 days later. It is well known that low vagal tone is associated with lower gut motility and increased inflammatory signaling. While these mechanisms provide biological plausibility, the observation in our pilot study needed further validation.

OBJECTIVE: To validate our previous finding that HF power in the first week of life can predict which preterm infants are at risk for NEC in the first month of life.

DESIGN/METHODS: 40 preterm (28 to 34 wks PMA) infants were enrolled and followed through discharge. Infants on mechanical ventilation or with congenital anomalies were excluded. HRV was done on DOL 5-8 in the afternoon post-feeding, and during sleep. For each epoch of sampling, spectral analysis was used to determine HF power (0.3-1.3 Hz). Prospective chart audits for NEC were done.

RESULTS: Subjects included 40 healthy preterm infants with GA of 31.35 +/- 1.80 wks (Mean +/- SD), BW of 1725 +/- 419g, and 63.5% were male. The SNAP morbidity index was 2.21 +/- 1.11. Five (12.5%) of 40 developed NEC (Bell’s Stage 2+) 4-25 days after HRV was measured. HF in infants who subsequently developed NEC was 4.02 +/- 2.53 msec² vs 11.86 +/- 5.73 msec² for those who did not develop NEC (p=0.003).

An HF power of 4.68 msec² discriminates which infants will develop NEC with a sensitivity and specificity of 80% and 91.4% respectively, and positive and negative predictive value of 57% and 96.0% respectively.

CONCLUSIONS: Our findings indicate that healthy infants with HF power <4.68 msec² on DOL 5-8 are at increased risk for subsequent NEC. HF power in first week of life can serve as a useful screening tool for NEC risk.

First Author is a Fellow in Training

E-PAS2013: 3838.636

Session: Poster Session: Neonatology - General (4:15 PM - 7:30 PM)
Date/Time: Monday, May 6, 2013 - 4:15 PM
Room: Hall D/E - Walter E. Washington Convention Center
Board: 636
Course Code: 3838

Fig 1 - HF power (DOL 5-8) in NEC and Non-NEC cases