

Title of Abstract:

Probiotic and Human Milk-based HMF Feeding Bundle Reduces NEC in VLBWs

Name of Abstract Submitter:

Loc Le, MD - Medical Director, Good Samaritan Hospital NICU

Organization:

Mednax Medical Group

Co-Author / Co-Investigators:

Alexis Davis, MD; Meera Sankar, MD; Sridevi Venigalla, MD; Tung-Ho Wang, MD; Chrissy Weng, RN

Abstract Description:

PROBLEM DESCRIPTION

Numerous studies have shown that probiotics and human milk-based, human milk fortifier (hHMF) may decrease rates of necrotizing enterocolitis (NEC), time to full feeds (TTFF), and length of stay (LOS) in VLBW infants. Despite instituting standardized feeding algorithm, antibiotic stewardship, and high maternal/donor breast milk use, our NEC rate (2010-2014) exceeded the CPQCC benchmark.

AIM

To decrease NEC and associated mortality, TTFF, and LOS by implementing probiotics and hHMF (Prolacta) into a VLBW feeding bundle.

MEASURES

Primary outcome: NEC stage 2 or greater and NEC-related death. Secondary measures: duration of central line use (as proxy for TTFF) and LOS. TPN is typically stopped when feeds reach 120ml/kg/day, and central lines are removed 24 hours after TPN is discontinued. Balancing measures: probiotic-associated sepsis and daily weight gain due to concerns of poor growth on hHMF.

PDSA CYCLES

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Cycle 1-Planning and baseline data collection: (2014) Reviewed NEC data, literature, and surveyed local NICU practices. *Lactobacillus reuteri* suspension (Biogaia) was chosen based on ease of administration, efficacy/safety evidence, and history of local use.

Cycle 2- Implementation of probiotics: Met with pharmacy, microbiology, nutrition and risk management to promote "buy-in"; developed protocol; completed nursing education. Probiotics initiated 1/27/15. Due to 2014 FDA probiotics advisory, signed parental consent obtained before initiation.

Cycle 3- Review of probiotic intervention: Initial 4 months (1/27/16-5/31/15), 97% (30/31) of families consented; 2 surgical NEC cases (6.5%) occurred with no deaths.

Cycle 4- hHMF implementation: (6/1/15-5/30/16) hHMF fortification implemented for BW ≤ 1500 g until 35 0/7 weeks PMA; 1 NEC-related death (1.5%) occurred in 4/2016.

Cycle 5- Revision of hHMF criteria: (6/1/16-present) Due to cost, hHMF restricted to BW ≤ 1250 g, discontinued at 33 weeks PMA. BW 1251-1500g fortified with extensively hydrolyzed HMF (Sim HMF).

OUTCOMES

Since the implementation of both probiotics and hHMF, NEC decreased from 6.4% (2010-2014) to 1.5% (2016). Central line use was unchanged. LOS decreased from 77.4 days (2015) to 63.3 days (2016). Median daily weight gain increased from 12.9g (2015) to 17.5g (2016). Parental acceptance of probiotics was high, and no adverse events were noted.

CONCLUSION

Probiotics and hHMF fortification improved NEC rates and LOS without probiotic-associated sepsis, but did not affect TTF as measured by duration of central line use. Growth improved, either through improved feeding tolerance or a reduction in growth failure that may occur with NEC. Continued surveillance is warranted to confirm improvements are sustained following modification of bundle to reduce cost.

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None