HYALURONAN IN EXPERIMENTAL NECROTIZING ENTEROCOLITIS (NEC)
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BACKGROUND
- Necrotizing enterocolitis (NEC) continues to be one of the most deadly gastrointestinal diseases in preterm infants
- Breast milk (BM) has various protective factors which enhances innate and adaptive immunity of gut
- BM also contains complex carbohydrates known as glycans which has prebiotic properties
- Hyaluronan (HA), is a glycosaminoglycan present in high concentrations in BM
- HA, either from BM or purified with a MW of ~35kDa, enhances the innate immunity of the intestinal epithelium and protects against intestinal bacterial infections

OBJECTIVE
- To determine the role of HA 35 on a murine model of NEC

Hypothesis: Oral administration of HA reduces the incidence and severity of experimental NEC

METHODS
- CD1 pups were divided into 3 groups: Sham, NEC, and NEC + HA
- HA administered orally at two different doses: 15 and 30 mg/kg

RESULTS CONT.

A. HA decreases mortality in a dose dependent manner
- HA significantly reduced mortality (~70%, 90% in the NEC + HA 15.30mg/kg vs 52% in NEC, P<0.05)

B. HA maintains intestinal permeability in a dose dependent manner
- HA treated pups had lower serum FITC dextran (2456 ± 211 ng/ml in NEC + HA vs 5041 ± 221 ng/ml in untreated NEC)

C. HA attenuates intestinal injury in a NEC model
- Lower NEC scores (1.2 ± 0.28 in NEC + HA group vs 2.3 ± 0.32 in NEC, P <0.0001)

D. Effect of HA on cytokine expression
- Plasma expression of proinflammatory cytokines were statistically significantly lower in both high and low dose HA groups

CONCLUSIONS
- Oral administration of Hyaluronic acid (found in high concentrations in breast milk) at MW ~ 35kD in DK NEC model:
  - Decreases mortality in a dose dependent manner
  - Maintains intestinal permeability
  - Reduces severity of intestinal injury and inflammation