Early gradual feeding with bovine colostrum improves gut function and NEC resistance relative to infant formula in preterm pigs - DTU Orbit (23/01/2019)

Early gradual feeding with bovine colostrum improves gut function and NEC resistance relative to infant formula in preterm pigs

It is unclear when and how to start enteral feeding for preterm infants when mother’s milk is not available. We hypothesized that early and slow advancement with either formula or bovine colostrum stimulates gut maturation and prevents necrotizing enterocolitis (NEC) in preterm pigs, used as models for preterm infants. Pigs were given either total parenteral nutrition (TPN, n = 14) or slowly advancing volumes (16–64 ml/kg·day) of preterm infant formula (IF, n = 15) or bovine colostrum (BC, n = 13), both given as adjunct to parenteral nutrition. On day 5, both enteral diets increased intestinal mass (27 ± 1 vs. 22 ± 1 g/kg) and glucagon-like peptide 2 release, relative to TPN (P <0.05). The incidence of mild NEC lesions was higher in IF than BC and TPN pigs (60 vs. 0 and 15%, respectively, P <0.05). Only the IF pigs showed reduced gastric emptying and gastric inhibitory polypeptide release, and increased tissue proinflammatory cytokine levels (IL-1 and IL-8, P <0.05) and expression of immunerelated genes (AOAH, LBP, CXCL10, TLR2), relative to TPN. The IF pigs also showed reduced intestinal villus-to-crypt ratio, lactose digestion, and some plasma amino acids (Arg, Cit, Gin, Tyr, Val), and higher intestinal permeability, compared with BC pigs (all P <0.05). Colonic microbiota analyses showed limited differences among groups. Early feeding with formula induces intestinal dysfunction whereas bovine colostrum supports gut maturation when mother’s milk is absent during the first week after preterm birth. A dietdependent feeding guideline may be required for newborn preterm infants.

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