Weaning is associated with an up-regulation of expression of inflammatory cytokines in the intestine of piglets

Cytokines play a central role in immune cell response but they also participate in the maintenance of tissue integrity. At weaning in pigs, changes in cytokine network may be expected in the gut since abrupt changes in dietary and environmental factors lead to important morphological and functional adaptation of the gut. In this study 45, 28 d-old piglets were used to measure the gene expression of six inflammatory cytokines by RT-PCR along the small intestine (SI) and the proximal colon at different time points (0, 1, 2, 5 and 8 d) post-weaning.

Villous/crypt architecture and enzymatic activities of lactase and sucrase in the SI were also examined. Our results confirmed that weaning is associated with morphological and enzymatic changes in the SI. In addition, our data indicated that cytokine response in the gut could be divided in two periods: an early acute response (d0 to d2 post-weaning) and a late long lasting response (d2 to d8 post-weaning). Between d0 and d2, there was an increase in the levels of IL-1b, IL-6 and TNF-a mRNA. Significant up regulation of IL-1b mRNA was observed in most parts of the intestine whereas, IL-6 and TNF-a mRNA significantly increased only at specific sites of the intestine.

Between d2 to d8, the levels of IL-1b, IL-6 and TNF-a mRNA rapidly returned to pre-weaning values, except for TNF-a mRNA that remained high in the distal SI. A significant decrease of IL-12p40 and IL-18 mRNA as compared to d0 was also noted. Taken together our results demonstrate that weaning in piglets is associated with an early and transient response in gene expression of inflammatory cytokines in the gut.

Reported by
INRA- Lab Pharmacology-Toxicology
180 chemin de tournefeuille
31000 Toulouse
France
See on map

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