

Topic: Infant gut microbiota

Title: Exposure to household furry pets influences the gut microbiota of infant at 3-4 months following various birth scenarios.

Conclusion: Exposure to pets increased the abundance of two bacteria, *Ruminococcus* and *Oscillospira*, which have been negatively associated with childhood atopy and obesity.

Authors: Tun HM, Konya T, Takaro TK, Brook JR, Chari R, Field CJ, Guttman DS, Becker AB, Mandhane PJ, Turvey SE, Subbarao P, Sears MR, Scott JA, Kozyrskyj AL; CHILD Study Investigators.

Citation: Microbiome. 2017 Apr 6;5(1):40.

Abstract: **BACKGROUND:** Early-life exposure to household pets has the capacity to reduce risk for overweight and allergic disease, especially following caesarean delivery. Since there is some evidence that pets also alter the gut microbial composition of infants, changes to the gut microbiome are putative pathways by which pet exposure can reduce these risks to health. To investigate the impact of pre- and postnatal pet exposure on infant gut microbiota following various birth scenarios, this study employed a large subsample of 746 infants from the Canadian Healthy Infant Longitudinal Development Study (CHILD) cohort, whose mothers were enrolled during pregnancy between 2009 and 2012. Participating mothers were asked to report on household pet ownership at recruitment during the second or third trimester and 3 months postpartum. Infant gut microbiota were profiled with 16S rRNA sequencing from faecal samples collected at the mean age of 3.3 months. Two categories of pet exposure (i) only during pregnancy and (ii) pre- and postnatally were compared to no pet exposure under different birth scenarios. **RESULTS:** Over half of studied infants were exposed to at least one furry pet in the prenatal and/or postnatal periods, of which 8% were exposed in pregnancy alone and 46.8% had exposure during both time periods. As a common effect in all birth scenarios, pre- and postnatal pet exposure enriched the abundance of *Oscillospira* and/or *Ruminococcus* ($P < 0.05$) with more than a twofold greater likelihood of high abundance. Among vaginally born infants with maternal intrapartum antibiotic prophylaxis exposure, *Streptococcaceae* were substantially and significantly reduced by pet exposure ($P < 0.001$, $FDR_p = 0.03$), reflecting an 80% decreased likelihood of high abundance (OR 0.20, 95%CI, 0.06-0.70) for pet exposure during pregnancy alone and a 69% reduced likelihood (OR 0.31, 95%CI, 0.16-0.58) for exposure in the pre- and postnatal time periods. All of these associations were independent of maternal asthma/allergy status, sibblingship, breastfeeding exclusivity and other home characteristics. **CONCLUSIONS:** The impact of pet ownership varies under different birth scenarios; however, in common, exposure to pets increased the abundance of two bacteria, *Ruminococcus* and *Oscillospira*, which have been negatively associated with childhood atopy and obesity.