

Associations and Interactions of Delivery Mode and Antibiotic Exposure with Infant Cortisol Level: A Correlational Study

Authors : Samarpreet Singh, Gerald Giesbrecht

Abstract : Both c-section and antibiotic exposure are linked to gut microbiota imbalance in infants. Such disturbance is associated with the Hypothalamic-Pituitary-Adrenal (HPA) axis function. However, the literature only has contradicting evidence for the association between c-sections and the HPA axis. Therefore, this study aims to test if the mode of delivery and antibiotics exposure is associated with the HPA axis. Also, whether exposure to both interacts with the HPA-axis. It was hypothesized that associations and interactions would be observed. Secondary data analysis was used for this co-relational study. Data for the mode of delivery and antibiotics exposure variables were documented from hospital records or self-questionnaires. In addition, cortisol levels (Area under the curve with respect to increasing (AUCi) and Area under the curve with respect to ground (AUCg)) were based on saliva collected from three months old during the infant's visit to the lab and after drawing blood. One-way and between-subject ANOVA analyses were run on data. No significant association between delivery mode and infant cortisol level was found, AUCi and AUCg, $p > .05$. Only the infant's AUCg was found to be significantly higher if there were antibiotics exposure at delivery ($p = .001$) or their mothers were exposed during pregnancy ($p < .05$). Infants born by c-section and exposed to antibiotics at three months had higher AUCi than those born vaginally, $p < .02$. These results imply that antibiotic exposure before three months is associated with an infant's stress response. The association might increase if antibiotic exposure occurs three months after a c-section birth. However, more robust and causal evidence in future studies is needed, given a variable group's statistically weak sample size. Nevertheless, the results of this study still highlight the unintended consequences of antibiotic exposure during delivery and pregnancy.

Keywords : HPA-axis, antibiotics, c-section, gut-microbiota, development, stress

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