Influences of a Maternal High-Fat Diet (HFD) and Serotonin Transporter (SERT) Deficiencies on Cognitive Flexibility

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The rising cases of children with autism spectrum disorders (ASD), having restrictive repetitive and impaired social behaviors, can be linked to maternal factors during fetal development. Additionally, high-fat diets (HFD) and serotonin transport (SERT) deficiencies have been shown to increase the deficits found in ASD and affect cognitive flexibility, so identifying the influences of maternal HFD and SERT deficiencies in relation to cognitive flexibility are important to future generational development and health. Heterozygous SERT-deficient and wild-type SERT mice were put on either a maternal HFD or control diet, and the offspring were tested by a Water T-maze spatial learning task to identify the number of errors/per day and trial time completion when learning, and after platform location reversal to test cognitive flexibility. The mice went through ten trials/per day for five days, with reversal day on Day 4. With no significant differences in weight or number of errors/day across diet types in both sexes, the only difference was on Day 5 where WT HFD females took longer to complete the trials. The findings of the experiment reveal that increasing maternal dietary fat during pregnancy doesn't impair cognitive flexibility tested by the Water T-maze assay in either heterozygous SERT-deficient or wild-type SERT mice.

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