Effects of EGCG Treatment of Ts65Dn Down Syndrome Mice on a Balance Beam Task

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Down syndrome (DS) is caused by trisomy of chromosome 21, and affects 1/700 live births. DS results in about 80 clinical phenotypes, including cognitive impairment. *DYRK1A*, a chromosome 21 gene, has been linked to alterations in morphology and function of the brain resulting in cognitive impairment. Epigallocatechin-3-gallate (EGCG), an inhibitor of DYRK1A activity, has been proposed as a possible treatment for cognitive deficits seen in individuals with DS. Using the Ts65Dn DS mouse model, we examined the effects of EGCG treatment on cerebellum dependent tasks using a balance beam test. We hypothesized that treatment with EGCG would improve Ts65Dn performance on the balance beam. In a first experiment, mice were given a dose of ~30 mg/kg/day EGCG, which showed no significant improvement in the balance beam task. In a second experiment, mice were given a dose of 100 mg/kg/day EGCG or water (control) starting at 3 weeks of age. The mice were handled two days before testing and then underwent a series of behavioral tasks including the balance beam test. The mice traversed three beams of differing widths (12, 9 and 6 mm), and three consecutive trials for each were recorded for further analysis. The balance beam recordings were scored by three independent scorers, blind to genotype and treatment, and the number of hind paw slips for each trial were scored. Our preliminary results indicate that the Ts65Dn mice are impaired at this task and have more hind paw slips compared to euploid controls. A larger number of animals should help to distinguish any differences in Ts65Dn mice due to EGCG treatment.

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