

Posters

Effects of green tea extracts on learning and memory behaviour in rats

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Background - Green tea contains various bioactive compounds, such as polyphenol antioxidants and caffeine. There have been numerous claims of health benefits in association with tea consumption, including hypolipidemic effect and blood pressure reduction. There are also suggestions that tea consumption may improve brain functions.

Objective - This study investigated the short- and long-term effects of green tea extract ingestion on learning and memory behaviour in rats. The protective effects of tea extract ingestion on brain oxidative stress were also examined.

Design - Male SD rats of 4 or 12 weeks of age were assigned to three treatment groups with five animals in each group. To study the short-term effect, the animals were administered via an oral-gastric tube 1.0 mL/100g body weight of water containing 0, 0.3 or 3 mg/mL green tea extracts. Learning and memory behaviour was assessed 30 minutes after the tea extract administration using Morris water maze test. The experimental animals were then maintained on standard laboratory chow with drinking water containing 0, 0.03 or 0.3 mg/mL tea extracts for nine months. The learning and memory behaviour of the animals was assessed again at the end of the feeding trial. At the end of the experiment, all animals were euthanized and the brain tissue samples were collected for measurements of oxidative stress.¹

Outcome - Oral-gastric administration of the tea extracts significantly improved the learning and memory ability in the rats in a dose and age dependent manner. In 4-week-old rats oral administration of 0.3 mg/100g body weight of the green tea extracts significantly reduced the escape latency in the water maze test while in 12-week-old rats oral administration of 3 mg/100g body weight of the extract significantly reduced the escape latency. Long-term ingestion of the tea extracts had no significant effect on the learning and memory behaviour but reduced brain tissue oxidative stress level.

Conclusion - Consumption of green tea may have a beneficial effect on the brain.

References

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Effects of oral ingestion of colostrum on intestinal expression of TGF-beta receptors in the newborn pig

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Background - An earlier study in our laboratory showed a transient decline of TGF-beta receptor intensity in the intestinal epithelium in newborn pigs following the onset of suckling. It was speculated that such decline may result from the exposure of the intestine to colostrum-borne TGF-beta.

Objective - This study examined the effects of oral ingestion of diets known to contain very different levels of TGF-beta on intestinal TGF-beta receptor intensity in newborn pigs.

Design - A total of 25 newborn piglets were bottle-fed with equal volume of porcine colostrum, bovine colostrum, porcine milk, human infant formula or water for 24 hours. Five naturally suckled piglets were used as the control. At the end of the feeding experiment, all animals were euthanized and the expression intensity of TGF-beta receptors in the small intestine was estimated by immunohistochemical staining.

Outcome - Oral ingestion of liquid diets had significant effects on the expression intensity and distribution of TGF-beta receptors in the small intestine of newborn pigs. In pigs fed with milk, milk formula or water, intensive expression of the receptors was seen in the basal membrane of the intestinal villous epithelium and in the Brunner's glands of the duodenum. Oral ingestion of colostrum significantly reduced the expression intensity of the receptors in the villous epithelial cells and the Brunner's glands ($P < 0.05$). The reduction was up to 60% when estimated by immunostaining intensity. On the other hand, the villous height and crypt depth of the small intestine were significantly greater in pigs fed colostrum than those fed milk, milk formula or water.

Conclusion - Exposure of newborn pigs to colostrum, which is known to contain high levels of TGF-beta, leads to a down-regulation of TGF-beta receptor expression in the small intestine.