Exclusive Cow Milk Consumption Induces Iron Deficiency Anaemia in Weanling Mice, and Affects Performance in the Y-Maze Working Memory Test

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Abstract:

The deficiency of iron, a micronutrient of public health importance is highly prevalent worldwide. Few population studies has shown association between cow milk consumption and anaemia, but paucy data is found on animal studies. This study investigated the effect of a 28 days exclusive cow milk consumption on haemoglobin concentration, faecal, hepatic and brain iron content, working memory, and histology of the hippocampus of weanling mice. Twenty mice, were divided into two; group1 (fed mouse chow), group 2 (consumed cow milk). All laboratory, and statistical analysis were done using standard protocols. There were significant ($p<0.05$), decreases in haemoglobin concentration (g/dl) (8.76 ± 1.50), hepatic (0.07 ± 0.01), and brain (0.06 ± 0.01) iron stores (mg/g tissue) in group 2, when compared with group 1. Faecal iron was higher ($p>0.05$) in group 2. In the Y-maze test, there was no significant ($p>0.05$) difference in the percentage entry into the novel arm, however, total arm entries significantly ($p<0.05$) decreased in group 2. Poor neuronal processes, with more neuroglial cells were observed in the CA3 region of mice in group 2. Therefore, a 28 day exclusive cow milk consumption induces anaemia, affects the hippocampal structure, and the working memory of weanling mice.

Keywords:

Cow milk, anaemia, working memory, hippocampus.