POSTERS

EFFECTS OF DIETARY FRUCTOSE ON DUODENAL MUCIN GLYCOSYLATION AND MUCUS PRODUCTION IN MICE FED A HIGH-FAT DIET

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Dietary fructose is associated with obesity1 and metabolic alterations, yet its effects on intestinal mucins and mucus glycosylation remain poorly understood. This study investigated whether fructose supplementation modulates high-fat diet (HFD)-induced changes in duodenal mucin production in an age-dependent manner. Young and adult mice were fed a normal diet (ND), HFD, or HFD supplemented with 30% fructose in drinking water (HFD+Fru) for 16 weeks. Brunner's glands and villus goblet cells were analyzed by conventional histochemistry and a panel of lectins to evaluate possible alterations in intestinal mucus glycosylation. Results showed that both HFD and HFD+Fru significantly increased body weight. In young mice, HFD+Fru induced a compensatory mucosal response characterized by increased PAS reactivity, enhanced sialylated mucin secretion, and higher SNA and PNA reactivity in villus goblet cells. In contrast, adult mice showed a maladaptive phenotype, with reduced PAS-positive mucins, decreased mucin secretion, diminished sialylation and GlcNAc expression, and marked loss of fucosylation in Brunner's glands and villus goblet cells. These findings demonstrate that fructose-enriched HFD remodels duodenal mucin O-glycosylation in an age-dependent manner, promoting adaptive responses in young mice but impaired epithelial barrier protection in adults. Such alterations may contribute to diet-related intestinal dysfunction and obesity-associated complications later in life.

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References

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