

A053 Short Term Consumption of Western Diet Increases the Severity of Giardia Infection in Association with Gut Microbiota Dysbiosis

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Introduction: *Giardia duodenalis* is a parasite responsible for giardiasis, a leading cause of diarrheal disease worldwide. Western diets (WD), which are characterized by a high intake of fat, are known to promote the development of gut inflammatory conditions. We investigated the impact of short-term consumption of WD on the severity and duration of giardiasis. We hypothesized that WD may contribute to the persistence of *Giardia* in the gut, in association with increased disease severity and microbiota dysbiosis. **Methods:** C57/BL6 mice were fed for 2 weeks with Western high fat (HF) diet or low-fat (LF) diet prior to infection with *G. duodenalis* GSM. Gut motility and stool water content were assessed before sacrifice at day 7 post infection (PI). Small intestine and colonic sections were collected at day 7 PI for parasite burden and histopathological study. Gut microbiota was determined by 16S RNA sequencing. The effect of oleic (OA) and palmitic acids (PA) on *Giardia* trophozoite metabolic activity was determined by resazurin assay. Tight junction disruption in SCNB cells infected with *Giardia* (isolate NF and GSM) in presence of OA or PA was determined by immunofluorescence. **Results:** *Giardia* infected C57/BL6 mice fed with HF diet exhibited a higher trophozoite burden 7 days PI compared to LF infected mice. *Giardia* infected mice also exhibited enhanced mucosal damage (villus-crypt ratio) when fed with HF diet compared to LF infected mice. Increased gut motility and increased water stool content were observed in HF infected mice. *Giardia* infected HF mice exhibited microbiota dysbiosis, with fecal microbiota analysis indicating an increase of Verrucomicrobia and decrease of Firmicutes. *Giardia* trophozoite metabolic activity was enhanced in the presence of oleic acid and palmitic acid. OA and PA worsened the disruption of tight junctional proteins (ZO-1, Claudin-1 and 4) in SCBN cells infected with *G. duodenalis* (NF and GSM). **Conclusion:** This study gives new insight into how diet may influence the outcome of parasitic diseases. The findings suggest that short term consumption of WD may increase the severity of giardiasis by, at least in part, promoting the growth of *Giardia* through fatty acid supplementation, predisposing to loss of epithelial integrity, and facilitating microbiota modulation. Therefore, diet intervention such as low-dietary fat may be beneficial during parasitic enteritis.