Effect of supplementation of fermented milk drink containing probiotic Lactobacillus casei Shirota on the concentrations of aflatoxin biomarkers among employees of Universiti Putra Malaysia

ABSTRACT

Human exposure to aflatoxin is through the diet, and probiotics are able to bind aflatoxin and prevent its absorption in the small intestine. This study aimed to determine the effectiveness of a fermented milk drink containing Lactobacillus casei Shirota (LcS) (probiotic drink) to prevent aflatoxin absorption and reduce serum aflatoxin B1-lysine adduct (AFB1-lys) and urinary aflatoxin M1 concentrations. The present study was a randomised, double-blind, cross-over, placebo-controlled study with two 4-week intervention phases. In all, seventy-one subjects recruited from the screening stage were divided into two groups--the Yellow group and the Blue group. In the 1st phase, one group received probiotic drinks twice a day and the other group received placebo drinks. Blood and urine samples were collected at baseline, 2nd and 4th week of the intervention. After a 2-week wash-out period, the treatments were switched between the groups, and blood and urine samples were collected at the 6th, 8th and 10th week (2nd phase) of the intervention. No significant differences in aflatoxin biomarker concentrations were observed during the intervention. A within-group analysis was further carried out. Aflatoxin biomarker concentrations were not significantly different in the Yellow group. Nevertheless, ANOVA for repeated measurements indicated that AFB1-lys concentrations were significantly different (P=0·035) with the probiotic intervention in the Blue group. The 2nd week AFB1-lys concentrations (5·14 (SD 2·15) pg/mg albumin (ALB)) were significantly reduced (P=0·048) compared with the baseline (6·24 (SD 3·42) pg/mg ALB). Besides, the 4th week AFB1-lys concentrations were significantly lower (P<0·05) with probiotic supplementation than with the placebo. Based on these findings, a longer intervention study is warranted to investigate the effects of continuous LcS consumption to prevent dietary aflatoxin exposure.

Keyword: Probiotic bacteria; Lactobacillus casei Shirota; Aflatoxin biomarkers; Serum aflatoxin B1-lysine adduct; Urinarya flatoxin M1