Oral administration of Lactobacillus casei Shirota can ameliorate the adverse effect of an acute aflatoxin exposure in sprague dawley rats

ABSTRACT

Aflatoxin B_1(AFB_1) is a toxic compound commonly found in some crops with an adverse health effect on human and animals. Some beneficial microorganisms (or probiotics) such as lactic acid bacteria have shown the ability to reduce the bioavailability of aflatoxins and its intestinal absorption. However, the dose and duration of aflatoxins exposure and probiotic treatment can influence the ability of probiotics to remove aflatoxins. Therefore, this research aimed to investigate the efficacy of oral probiotic Lactobacillus casei Shirota strain (LcS) induction in an acute exposure to AFB_1 in rats. Experimentally, Sprague Dawley rats were divided into three groups: AFB_1 only (n = 9); AFB_1 treated with LcS (n = 9); and control (no AFB_1 exposure) (n = 6) groups. The blood AFB_1 level of rats treated with LcS was slightly lower than the untreated AFB_1 induced rats (11.12 ± 0.71 vs 10.93 ± 0.69 ng g-1). Also, LcS treatment slightly moderated the liver and kidney biomarkers in AFB_1 induced rats. However, a trend for a significant difference was only observed in ALT of AFB_1 induced rats treated with LcS compared to their counterparts (126.11 ± 36.90 vs 157.36 ± 15.46, p = 0.06). Rats' body weight decreased in all animals force-fed with AFB_1 with no significant difference between LcS treatment compared to the counterpart. In conclusion, this experiment indicated that probiotic LsC was able to slightly ameliorate the adverse effect of an acute exposure to AFB_1 in rats. However, future studies with longer probiotics treatment or higher probiotics dose is required to confirm these findings.

Keyword: Aflatoxin B; Acute aflatoxicosis; Animal study; Probiotic shirota