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Protective effect of low molecular weight fucoidan on aspirin induced stomach ulceration in rats

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Despite the cardiovascular benefits of aspirin, a potential gastrointestinal harm has been noted in several clinical and pre-clincal studies[1]. The side effects of aspirin are characterized by infiltration of neutrophils, growth factor inhibition, and elevation of cytokines, which is produced by activated macrophages[2]. Fucoidan has been drawing attention because of its interesting biological activities on pro- and anti-inflammatory cytokines, Therefore, in this study, the possibility of fucoidan as a subatance with potential for gastric protection has been demonstrated. Also, to understand the mechanistic action of fucoidan, fucoidan of varying molecular weight has been assessed.

Different molecular weight fucoidan were evaluated on biochemical (aspartate (AST) and alanine transaminases (ALT), creatinine, blood urea nitrogen (BUN), total cholesterol and triglyceride) and immunological parameters such as cytokines (INF-γ, IL-6 & IL-10) on aspirin-induced ulcer in rats (groups of $n = 7$). The status of stomach tissue glycogen storage and histological changes were also examined. Examination of basic biochemical parameters using auto analyzer showed significant ($p<0.01$) alterations in AST and ALT in ulcer induced animals. However moderate alterations ($p<0.05$) were observed in the levels of cholesterol and BUN. Analysis of aspirin treated rats serum cytokines using enzyme linked immunosorbent assay showed a moderate decrease in IL-10 with considerable increase of IL-6 and INF-γ as compared to control. Histopathological examination showed neutrophil infiltration, inflammation in oxyntic cells with altered glycogen storage (Periodic acid Schiff's staining).

Administration of high molecular weight fucoidan (about 200 kDa, 0.02 g/kg body weight, for two weeks p.o) showed considerable ($p<0.05$) protection against ulceration by inhibiting the acute alterations of AST, ALT, cytokines and stomach glycogen when compared with untreated ulcerated model. Rats that received low molecular weight fucoidan (10 kDa, 0.02 g/kg body weight, for two weeks p.o) also showed moderate inhibition on altered parameters as compared with ulcerated rats. However aggravated serum INF-γ was observed in all treated groups. These findings suggest that the anti-ulcer property of fucoidan was not altered significantly after degradation.

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1. Rogler G & Andus T (1998) *World J Surg* **22**, 382–389.
2. Konturek PC, Kania J, Gessner U *et al.* (2004) *Eur J Pharm* **506**, 69–77.