عنوان مقاله:

Acrylamide exposure aggravates the development of ulcerative colitis in mice through activation of NF-κB, inflammatory cytokines, iNOS, and oxidative stress

محل انتشار:

مجله علوم پایه پزشکی ایران, دوره 24, شماره 3 (سال: 1400)

تعداد صفحات اصل مقاله: 10

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خلاصه مقاله:

Objective(s): Acrylamide is a toxic compound that forms during food processing at high temperatures. Acrylamide has been shown to induce toxicity in various organs in the body. This study aimed to investigate the effect of acrylamide exposure on the susceptibility of the colon to ulcerative colitis in a mouse model. Materials and Methods: Mice were pretreated with acrylamide (oral, ۲۰ and ۳۰ mg/kg/day) for ۲۱ consecutive days, and colitis was induced by intrarectal administration of acetic acid. Results: The results revealed that acrylamide-pretreatment significantly increased disease activity index (DAI), macroscopic damage, histological changes of the colonic mucosa and oxidative stress markers carbonyl protein, malondialdehyde (MDA), and nitric oxide (NO), whereas it decreased the levels of anti-oxidants glutathione (GSH), superoxide dismutase (SOD) and catalase. Moreover, induction of colitis in acrylamide-pretreated mice caused a higher increase in colonic levels of myeloperoxidase (MPO), matrix metalloproteinase (MMP)-۹, monocyte chemoattractant protein (MCP)-۱, cytochrome-c, caspase-۳, proinflammatory cytokine tumor necrosis factor (TNF)-α, interleukin (IL)-۶, IL-۱β, and interferon (IFN)-γ, whereas it reduced the level of IL-۱۰. The mRNA expression of nuclear factor kappa B (NF-κB) and inducible nitric oxide synthase (iNOS) were further increased in colon tissue of mice exposed to acrylamide.Conclusion: These findings suggest that acrylamide can accelerate the development of acetic acid-induced colitis. In conclusion, chronic acrylamide exposure may aggravate the severity of ulcerative colitis and increase colonic mucosal damage through oxidative stress and inflammatory responses.

کلمات کلیدی:

Acrylamide, Apoptosis, Cytokines, Inflammation, Oxidative stress, Ulcerative colitis