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Leucovorin effect on 2,4,6-trinitrobenzenesulfonic acid (TNBS) colitis in rats

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This study examined whether leucovorin, used in colon cancer treatment, promotes healing of colonic tissue in a model of inflammatory bowel disease. Ten-week-old male Wistar rats were divided into five groups: Group 1 (control) received no medication; Group 2 received leucovorin 10 mg/kg. Colitis was induced in Groups 3–5 with 25mg 2,4,6-trinitrobenzene sulfonic acid (TNBS) in 37% ethanol; Groups4–5 received intraperitoneal leucovorin 3 or 10 mg/kg for 3 days. Macroscopic scoring and histopathological evaluation were performed. The colon weight-to-length ratio increased from 92.30 ± 3.29 (control) to 169.33 ± 12.69 in the TNBS group (P<0.001). This ratio improved to 140.14 ± 9.16 with 10 mg/kg leucovorin (P<0.01), but not with 3 mg/kg (166.94 ± 11.98, P<0.001). Macroscopic score fell from 2.88 ± 0.35 (TNBS) to 1.88 ± 0.13 with 10 mg/kg LV (P<0.05). Histopathologic evaluation showed a dose-dependent reduction in total score: 15.5 (TNBS), 13.0 (LV3, P>0.05) and 11.38 (LV10, P<0.05); significant decreases were seen in cellular infiltration and muscle thickening (P<0.05). Leucovorin promotes dose-dependent healing in a colitis model and may serve as an adjuvant therapy. This study supports further investigation of higher doses and longer regimens to determine maximal efficacy.

Keywords: Folic acid, Drug repurposing, Gut inflammation, Rational drug therapy, Vitamin B9