TU-100 exerts a protective effect against bacterial translocation by maintaining the tight junction

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Abstrak

PURPOSE: We previously reported that TU-100 suppresses irinotecan hydrochloride (CPT-11)-induced inflammatory cytokines and apoptosis. However, the mechanism underlying this effect has not been fully elucidated. The aim of this study was to further clarify the mechanism of CPT-11-induced bacterial translocation (BT) and the effect of TU-100 on BT.

METHODS: Cell cytotoxicity was assessed in vitro by a WST-8 assay. For the in vivo experiments, rats were randomly divided into 3 groups: the control group, the CPT-11 group (250 mg/kg i.p. for 2 days), and the CPT-11 and TU-100 co-treated group (1000 mg/kg, p.o. for 5 days). All of the rats were sacrificed on day 6 and their tissues were collected.

RESULTS: CPT-11 and TU-100 co-treatment improved CPT-11 the related cytotoxicity in vitro. All CPT-11-treated rats developed different grades of diarrhea and BT was observed in 80% of the rats. CPT-11 caused a significant increase in the expression of TLR4, IL-6, TNF-, IL-1 and caspase-3 mRNAs in the large intestine. The expression of tight junction (TJ) marker mRNAs (occludin, claudin-1 and 4, and ZO-1) was significantly decreased in comparison to the control group. TU-100 co-treatment significantly reversed diarrhea, BT, and the expression of TLR2, IL-6, TNF-, IL-1 and caspase-3, and improved the expression of occludin, claudin-4 and ZO-1.

CONCLUSIONS: TU-100 can suppress the adverse effects associated with CPT-11 and improve the function of the TJ. It is possible that this occurs through the TLR pathway.