

## Attenuative effects of G-CSF in radiation induced intestinal injury

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### 서론

Granulocyte colony stimulating factor (G-CSF) has been reported to protect from radiation-induced myelosuppression. Growing evidence suggests that G-CSF also has many important non-hematopoietic functions in other tissues, including the intestine (Kim et al., 2010; Kim et al., 2011). However, little is known about the influence of G-CSF on intestinal injury.

### 재료 및 방법

This study examined the radioprotective effects of G-CSF in intestinal and hematopoietic damage, and survival in gamma-irradiated C3H/HeN mice. G-CSF (100 µg/kg per body weight) was subcutaneously injected once daily for three days before radiation.

### 결과 및 고찰

Examination 12 hours after radiation (5 Gy) revealed that the G-CSF treated mice were significantly protected from apoptosis of jejunal crypt, compared with radiation controls. The JAK/STAT signaling pathway

has been suggested as a mediator of the anti-apoptotic effect of G-CSF.

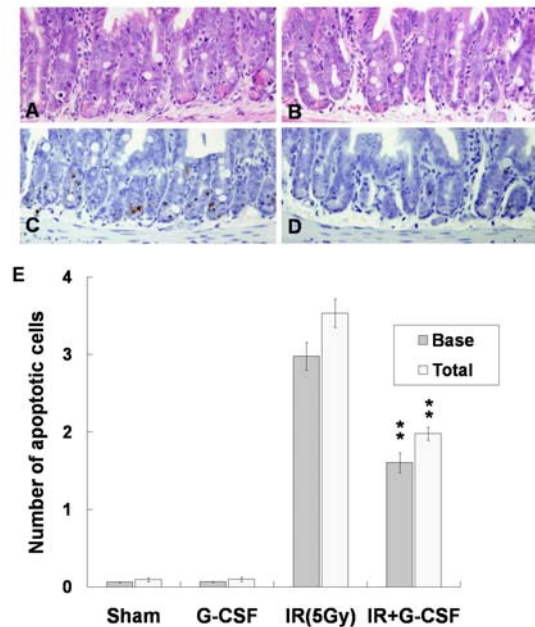


Fig. 1 Photomicrographs of the apoptotic changes in the jejunum in the H&E (A and B) and TUNEL stained (C and D) section of mouse intestine at 12 hours after 5 Gy radiation.

G-CSF treatment attenuated intestinal morphological changes such as decreased survival crypt, the number of villi, villous shortening, crypt depth and length of basal

lamina of 10 enterocytes compared with the radiation control 3.5 days after radiation (10 Gy). Growing evidence has been obtained from radiation accidents and from other physical insults to indicate that the "injured gut" plays a pivotal role in the course of the development of multi-organ involvement and, indeed, in patient survival.

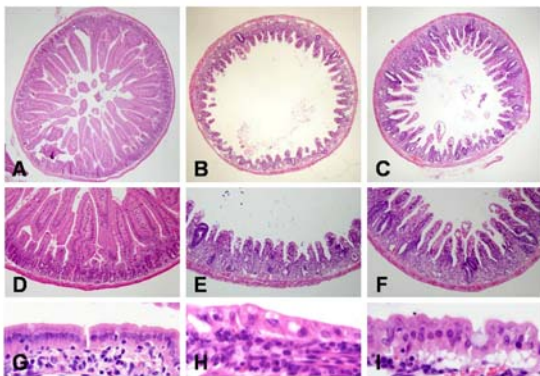


Fig. 2. Photomicrographs of the villi height (A–C), crypt survival (D–F) and length of basal lamina of 10 enterocytes (G–I) in the jejunal circumference in the H&E stained section of mouse intestine at 3.5 days after 10 Gy radiation.

G-CSF attenuated the change of peripheral blood from radiation-induced myelosuppression and displayed attenuation of mortality in lethally-irradiated (10 Gy) mice.

## 결론

The present results support the suggestion that G-CSF administered prior to radiation plays an important role in the survival of irradiated mice, possibly due to the

protection of hematopoietic cells and intestinal stem cells against radiation. The results indicate that G-CSF protects from radiation-mediated intestinal damage and from hematopoietic injury. G-CSF treatment may be useful clinically in the prevention of injury following radiation.

## 참고문헌

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