Effect of a glutamine-enriched elemental diet on regenerative and immune function of small intestinal villi.

1997 Fiscal Year Final Research Report Summary

Effect of a glutamine-enriched elemental diet on regenerative and immune function of small intestinal villi.

Research Project

Project/Area Number

08671425

Research Category

Grant-in-Aid for Scientific Research (C)

Allocation Type

Single-year Grants

Section

一般

Research Field

Digestive surgery

Research Institution

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1996 – 1997

Keywords

small bowel transplatntaion / c-jun / massive small bowel resection / c-fosse / elemental diet

Research Abstract

The effect of orally administered glutamine (Gln) -enriched elemental diet on the small intestinal mucosa was examined following orthotopic small bowel allotransplantation using Brown Norway rats as donors and Lewis rats as recipients. The recipients were treated with FK506 and randomized to receive Gln-free elemental enteral diet solution (Gln-free group), Gln-enriched elemental diet solution that contained 7500 mg of Gln per 100 g diet (Gln-enriched group) or standard chow (chow group) ad libitum for 7 days, then sacrificed on the 7th day after transplantation. Weight loss of the Gln-enriched group was significantly less than that of the chow group. Both plasma Gln levels and the ratio of Gln to total amino acids in the homogenate of the graft mucosa of the Gln-enriched group were significantly higher than those of the Gln-free group. Villous height and crypt depth were significantly decreased in the Gln-free group. THe BrdU labelling index in the graft epithelium and Al-p activity in the homogenate of the graft mucosa of the Gln-enriched group were significantly higher than those of the Gln-free group. Therefore, orally administered Gln-enriched elemental diet appears to promote the regeneration and differentiation of the graft mucosa following small bowel allotransplantation. The sequential expression of c-fosse and c-Jun was compared with the patterns of three coexistent parameters in order to investigate the mechanism of degeneration and regeneration of small intestine vili following ischemia/reperfusion. The results suggest that the overexpression of c-fosse and c-Jun following ischemia/reperfusion in the small intestine correlated with programd cell death and subsequent cellular regeneration.

Research Products (6 results)

All | Other

All | Publications (6 results)

[Publications] MASAO YAGI et al: "Effect of glutamine-eniches diet on small bowel allograft during immunosypressive therapy" Mutation. 13・9. 778-782 (1997)

[Publications] 長谷部 健 ほか: "ラット小腸大量切除後の残存小腸におけるc-fos.c-junの発現に関する検討" 消化と吸収. 20・2. 62-65 (1997)

[Publications] 伊藤 博: "小腸周辺再潅流と前部期遺伝子c-fos,c-junの過剰発現に関する実験的研究" 金沢大学十全医学会雑誌. 106・6. 644-653 (1997)

[Publications] MASAO YAGI et al.: "Effect of a glutamine-enriched diet on small bowel allograft during immunosuppressive therapy." Nutrition. 13-9. 778-782 (1997)

[Publications] Ken Hasebe et al.: "An experimental study of the expression of c-fos and c-Jun after massive small bowel resection in rats." Digestion and Absorptio. 20-2. 62-64 (1997)

[Publications] Hiroshi Itoh: "Overexpression on imediate early gene, c-fosse and c-Jun in the rat small intestine after ischemia/reperfusion." J.Juzen Med Soc.106-6. 644-653 (1997)

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