蘆薈凝膠對全胃切除大鼠之免疫調節以及腸道菌相保健功效之研究

Evaluating the Protective Effects of Aloe Vera Gel on the Immunomodulation and Fecal Microflora in Total Gastrectomized Rats

中文摘要

胃癌爲台灣的十大死因之一。每年許多罹患胃部腫瘤，或是胃潰瘍的病人會接受全胃或部分胃切除的治療。這些胃切除病人常出現腸道菌相不平衡、貧血、營養不良以及由於免疫功能降低而引起感染機率增加的後遺症。目前有許多支持性的飲食療法正被研發以減緩胃切除病人之後遺症。蘆薈在中、外醫學上已被廣乏應用，近年來亦有研究發現蘆薈含有植物性類固醇，具有減緩發炎、促進細胞新生及幫助組織修復等功效。故本研究擬利用全胃切除大白鼠的動物模式探討蘆薈凝膠的保健功效，比較飲食中添加蘆薈凝膠後對全胃切除大白鼠傷口癒合、免疫力、腸道菌相的影響。結果顯示在動物實驗中，全胃切除手術後會造成大鼠各種淋巴細胞比例下降，相較於對照組，服用蘆薈凝膠的組別各種淋巴細胞較能回復術前水準。蘆薈凝膠並可促進 NK 細胞之毒殺能力以及周邊血中整合素的表現，但對於周邊血吞噬細胞吞噬能力、脾臟及小腸淋巴結內淋巴細胞的重新分布、分裂能力及受刺激後細胞激素的釋放等則無明顯調節作用。在腸道菌相的結果發現服用蘆薈凝膠可抑制大腸桿菌的增殖，但不會促進益生菌叢的增生。進一步的細胞實驗中，蘆薈凝膠不但具有促進巨噬細胞株 RAW264.7 之吞噬能力，亦能促進其 NO 的分泌量。而以 NIH/3T3 細胞觀察蘆薈凝膠對傷口復原能力之試驗時，則可發現 5%、10%、15%蘆薈凝膠對損傷的 NIH/3T3 細胞均有促進細胞移動、生長之效果。綜合評估：蘆薈凝膠具有抑菌、促進吞噬細胞活性和 NK 細胞毒殺能力之免疫調節功能，對全胃切除老鼠之動物模式具一定的保健功效，但蘆薈凝膠對傷口復原影響之評估仍有賴進一步的實驗來證實。

英文摘要

Gastric cancer has been among the top 10 causes of death in Taiwan, and lots of patients with benign or malignant gastric tumor or gastric ulcer receive total or partial gastrectomy as a treatment. Among these gastrectomized patients, imbalanced gut microflora, anemia, malnutrition, and immunosuppression may often increase the opportunity of infection. Many ways of supportive diet have been evaluated for alleviation. Aloe vera has a long history as a safe, effective medicine, and it has also been proved that plant steroids in Aloe vera can relieve inflammation, help to regenerate new cells and disperse damaged tissue with no side-effects. Therefore, we adapted a total gastrectomized rat model to study the protective effects of Aloe vera on wound healing, anti-inflammation, immunity and the

redistribution of gut microflora. Our results showed that there were no significant differences in the ratio of lymphocyte subpopulation, but the administration of Aloe vera significantly increased the cytotoxic activity of Nature Killer cells than those in the control group. The gut microflora culture data showed that the administration of Aloe vera may reduce the amount of E. coli but has no prebiotic benefit on increasing the fecal Lactobacillus spp. and Bifidobacterium spp.counts. We further demonstrated that Aloe vera may stimulate the phagocytic activity and the NO production in RAW264.7 cells. By mechanically scratching the NIH 3T3 cells, we found that 5%, 10%, and 15% of Aloe vera may facilitate the proliferation and migration of NIH 3T3 cells at the wound margin. In conclusion, Aloe vera is shown here to contain some immunomodulating and wound healing activities, although the wound healing effects need to be further studied.