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• 計畫英文名稱	Metabolic Effects of Different Fat Emulsions on Glucose Tolerance, Plasma and Liver Lipids in Diabetic Rats Receiving TPN (II)
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• 中文關鍵字	全靜脈營養；糖尿病；魚油；脂肪乳劑；胰島素；血脂質；氮平衡
• 英文關鍵字	Total parenteral nutrition (TPN)；Diabetes mellitus (DM)；Fish oil；Fat emulsion；Insulin；Plasma lipid；Nitrogen retention
• 中文摘要	本研究在探討輸入高熱量(35kcal/100g 體重)含不同脂肪乳劑之全靜脈營養(Total parenteral nutrition,TPN)溶液後,對糖尿病鼠血糖、血脂、肝臟脂質及氮平衡之影響。實驗將 Wistar 鼠以 Stoeptozotocin(STZ)引致糖尿病後,進行頸靜脈插管,然後將老鼠分成兩組,其輸入之 TPN 溶液組成完全相同,只有脂肪乳劑不同,一組輸入含長鏈三酸甘油酯(LCT)之脂肪乳劑,另一組則輸入中鏈及長鏈三酸甘油酯各半(MCT/LCT)之脂肪乳劑,TPN 溶液之營養素組成爲葡萄糖 50%、脂肪 30%、胺基酸 20%、LCT 及 MCT/LCT 組,再各分爲兩組,一組每天注射胰島素(2U/100g body weight),一組則不注射,結果顯示輸入高熱量含不同脂肪乳劑之 TPN 溶液一星期後,MCT/LCT 及 LCT 組之糖尿病鼠,血中三酸甘油酯(TG)、游離脂肪酸(NEFA)、血糖均較未輸入前下降,但仍有體重減輕及負氮平衡的情形,胰島素注射使體重減輕的情形獲得改善,並有正氮平衡,但肝臟脂肪堆積卻顯著較未注射胰島素組高。輸入不同脂肪乳劑之組別間,則血漿 TG、總膽固醇、NEFA、血糖、氮平衡間並無差異,胰島素注射組中,LCT 組其肝臟脂質之堆積顯著高於 MCT/LCT 組,此結果顯示糖尿病鼠以高熱量輸入 TPN 溶液並不能改善糖尿病所引致之體重減輕及負氮平衡,注射胰島素雖可使體重減輕改善並有正氮平衡,卻會造成肝臟脂質堆積。
• 英文摘要	This study was conducted to investigate the effect of high energy infusion and different fat emulsions on plasma and hepatic lipids, and nitrogen retention in diabetic rats receiving total parenteral nutrition (TPN). Diabetes was induced in rats by streptozotocin (STZ), the diabetic rats were divided into two TPN groups. The TPN provided 35kcal/100g body weight, the energy distribution of the TPN solutions was 50% glucose, 20% protein and 30% fat. All TPN solutions were isonitrogenous and identical in nutrient composition except for the fat emulsion, which was composed of long chain triglyceride (LCT) or medium chain triglyceride (MCT) /LCT (1:1). LCT group and MCT/LCT group were subsequently

divided into two subgroups, one of which injected with insulin daily during the period of TPN infusion. The results demonstrated that plasma concentrations of triglyceride (TG), nonesterified fatty acid (NEFA) and glucose were significantly decreased after receiving TPN in all experimental groups. The diabetic rats without insulin treatment demonstrated weight loss and negative nitrogen balance despite high energy infusion. Insulin treatment significantly improve the condition of weight loss and positive nitrogen retention was observed. However, liver fat accumulation was significantly higher in insulin treated groups compared with groups without insulin treatment. No significant differences on plasma TG, total cholesterol, NEFA and nitrogen retention were seen between MCT/LCT and LCT group either in insulin treated or non-insulin treated groups. These results suggest that TPN with high energy infusion did not have beneficial effect on DM-induced weight loss and negative nitrogen retention. Insulin treatment significantly improved the condition of weight loss and positive nitrogen retention was observed in diabetic rats. Liver fat accumulation, however, was significantly higher in insulin treated groups.