

補益劑對於 streptozotocin 誘發高血糖鼠學習障礙之影響

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摘要

本研究探討補益劑（六味地黃丸、補中益氣湯、知柏八味丸及歸脾湯）對streptozotocin（STZ）誘發高血糖鼠在水迷宮學習障礙之影響，同時並測定標準葡萄糖耐受性測試及單胺濃度，以了解補益劑防治糖尿病暨學習障礙之機制。

實驗將老鼠隨機分為四組：（一）空白對照組（二）STZ誘導糖尿病組（三）中藥前處理組（四）中藥治療組。結果顯示，中藥前處理組僅補中益氣湯對STZ誘發高血糖鼠具血糖調節作用，而在此高血糖鼠學習障礙模式並無作用；而治療組對於血糖調節及STZ誘發高血糖鼠學習障礙皆有明顯的改善作用。再者，STZ誘發高血糖鼠之大腦皮質區NE濃度較正常大鼠減少，而大腦皮質區DA、5-HT濃度及海馬回區5-HT濃度均較正常大鼠增加。至於，六味地黃丸治療組之大腦皮質區NE濃度明顯較STZ誘發高血糖鼠為高，而DA及5-HT濃度則明顯為低；補中益氣湯治療組之大腦皮質區DA濃度明顯較STZ誘發高血糖鼠為低；知柏八味丸治療組之大腦皮質區NE濃度明顯較STZ誘發高血糖鼠為高，而海馬回區之5-HT濃度則明顯為低；歸脾湯治療組之大腦皮質及海馬回區5-HT濃度明顯較STZ誘發高血糖鼠為低。

綜上述結果可知補益劑對STZ誘發高血糖鼠均具治療之作用，且可改善STZ誘發高血糖鼠在水迷宮學習操作、參考記憶及工作記憶之障

礙，但各補益劑具有不同程度及型態之療效；而此作用不僅與調節血糖濃度有關，亦與降低大腦皮質DA及5-HT濃度或增加NE濃度有關。

The effects of Pu-I-prescriptions on learning deficitive hyperglycemia induced by streptozotocin in rats

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Abstract

The purpose of this study was to investigate the preventive and therapeutic effect of Pu-I-prescription (Liu-Wei-Di-Huang-Wan , Pu-Chung-I-Chi-Tang, Pa-Wei-Wan, Gui-Pi-Tang) on the impairment of water maze performance and hyperglycemia induced by streptozotocin (STZ) . We measured oral glucose tolerance as well as brain monoamine levels in order to understand the mechanism of the preventive and attenuating effects of Pu-I-prescription.

We grouped rats into four categories : one group treated with vehicle, second group induced by STZ, third group which STZ-induced diabetic rats pretreated with Pu-I-prescription, forth group which STZ-induced diabetic rats posttreated with Pu-I-prescription. These results showed that Pu-Chung-I-Chi-Tang treated before STZ treatment improve glucose regulation in STZ-induced diabetic rats, but all Pu-I-prescription treated after STZ treatment improve glucose regulation and maze performance. Furthermore , it's significant that cortex NE levels in STZ-diabetic rats was less than that in normal rats. On the contrary, it's significant that cortex DA and 5-HT levels and hippocampal 5-HT levels in STZ-diabetic rats was more than those in normal rats. Rats treated with Liu-Wei-Di-Huang-Wan

after STZ treatment has higher cortex NE levels than rats treated with STZ. On the contrary, Liu-Wei-Di-Huang-Wan after STZ treatment has lower cortex DA and 5-HT levels than rats treated with STZ. Rats treated with Pu-Chung-I-Chi-Tang after STZ treatment has lower cortex DA levels than rats treated with STZ. Rats treated with Pa-Wei-Wan after STZ treatment has higher cortex NE levels than rats treated with STZ. On the contrary, Pa-Wei-Wan after STZ treatment has lower hippocampal 5-HT levels than rats treated with STZ. Rats treated with Gui-Pi-Tang after STZ treatment has lower cortex and hippocampal DA levels than rats treated with STZ.

From these above results, we found that that Pu-I-prescription given before STZ treatment attenuated STZ-induced diabetic and the deficits in water maze performance, reference memory and working memory. We further suggest that therapeutic effects of Pu-I-prescription in STZ-induced diabetic rats might be due to improving glucose regulation but also decreasing cortex DA and 5-HT levels. As for Liu-Wei-Di-Huang-Wan and Pa-Wei-Wan, they might be related to increasing cortex NE levels.