

• 临床论著 •

天寿液对Ⅱ型糖尿病患者细胞膜活性和能量代谢的影响

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内容提要 用中药天寿液治疗Ⅱ型糖尿病患者65例半年, 患者红细胞膜脂区流动性和血清HDL₂-C水平明显增加, 血清胆固醇和血糖浓度则显著下降, 与治疗前比较, 差异均具有显著性意义。并对糖尿病发病机理及中药治疗意义进行了探讨。

关键词 天寿液 Ⅱ型糖尿病 红细胞膜脂区流动性 荧光偏振度 微粘度

糖尿病是一种比较常见的慢性进行性内分泌代谢紊乱性疾病。细胞膜脂区流动性、膜脂质组成、膜上酶活性及血清脂质浓度等的变化, 与糖尿病代谢有密切关系。我们采用自拟中药“天寿液”治疗非胰岛素依赖型(Ⅱ型)糖尿病患者65例, 观察治疗前后细胞膜活动性功能及糖和脂质代谢的变化, 探讨糖尿病的发病机理及中药对本病的治疗效果。

临 床 资 料

正常对照组: 82例, 男46例, 女36例, 年龄28~65岁, 无肝、肾及内分泌代谢疾病。

糖尿病组: 65例, 为Ⅱ型糖尿病患者, 按WHO诊断标准确诊。男34例, 女31例, 年龄45~76岁, 平均62.65岁, 平均病程8.7年; 所有患者除饮食控制外, 均服用降糖药, 短者1年, 长者达30余年, 血糖浓度控制不理想, 其中14例伴有高血压(BP20.0~22.7/12.0~13.9kPa), 11例有程度不等的白内障。

方 法

一、治疗方法: 65例Ⅱ型糖尿病患者, 在服用D860或优降糖或降糖灵等药物的基础上, 每

例均加服天寿液, 主要由养阴、益气、生津、调脂和降糖等作用的生地、熟地、黄芪、天花粉、知母、制首乌、泽泻、地骨皮、葛根、黄连等组成, 由华山医院中草药制剂室制备, 每毫升含生药量1.8g。每日3次, 每次口服20ml, 连续服用3个月为一疗程, 随访半年。

二、实验室检查

1. 红细胞膜脂区流动性: 根据Cooper等报道的方法^[1], 测得DPH标记的红细胞膜的偏振度(P), 求得平均微粘度(η)。

2. 红细胞钠泵活性: 根据Cumberbatch等改良法^[2]检测并计算细胞膜对钠进入细胞的通透性和钠泵活性。

3. 血清脂质浓度测定: 采用糖酐酯为沉淀剂, 用酶法分别测定血清胆固醇(TC)、高密度脂蛋白胆固醇(HDL-C)及亚组分(HDL₂-C及HDL₃-C), 单位浓度为mg/100ml。

4. 空腹血糖测定: 采用氧化酶法, 单位为mg%。

5. 统计方法: 以t检验统计。

结 果

一、天寿液对Ⅱ型糖尿病患者红细胞膜脂区流动性的影响: 共检测56例, 其中27例作了天寿液治疗半年前后的自身比较, 结果见表1。

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表1 天寿液对Ⅱ型糖尿病患者红细胞膜脂区流动性的影响 ($\bar{x} \pm S$)

组别	例数	荧光偏振度 (P)	微粘度 (η)
对照组	20	0.245 $\pm$ 0.002	2.282 $\pm$ 0.039
糖尿病组 治前	56	0.277 $\pm$ 0.003*	3.083 $\pm$ 0.111*
糖尿病组 治后	27	0.282 $\pm$ 0.004*	3.242 $\pm$ 0.098*
	27	0.268 $\pm$ 0.004 Δ^{**}	2.832 $\pm$ 0.095 Δ^{**}

注: 与对照组比较, * $P < 0.01$, $\Delta P > 0.05$; 与天寿液治疗前比较, ** $P < 0.01$

表1显示Ⅱ型糖尿病患者治疗前红细胞膜荧光偏振度(P)和微粘度(η)明显大于对照组, 天寿液治疗半年后, P及 η 明显降低。

二、43例糖尿病患者天寿液治疗前后红细胞钠泵活性和血糖浓度比较: 见表2。

表2 43例患者治疗前后红细胞钠泵活性和血糖浓度的比较 ($\bar{x} \pm S$)

组别	例数	红细胞钠泵活性	血糖 (mg%)
对照组	33	0.337 $\pm$ 0.030	90.1 $\pm$ 1.61
糖尿病组 治前	43	0.275 $\pm$ 0.012*	194.9 $\pm$ 9.11 Δ
糖尿病组 治后	43	0.266 $\pm$ 0.013**	153.9 $\pm$ 6.86 $\Delta\Delta$

注: 与对照组比较, * $P < 0.025$, $\Delta P < 0.001$; 与治疗前比较, ** $P > 0.05$, $\Delta\Delta P < 0.001$

表2显示糖尿病患者的红细胞钠泵活性明显低于对照组, 天寿液治疗半年后, 钠泵活性尚未恢复到正常水平; 患者治疗前血糖浓度明显高于对照组, 天寿液治疗半年后, 血糖浓度明显下降($P < 0.001$)。其中17例治疗后血糖浓度控制在130mg以下。

表3 糖尿病患者中药天寿液治疗前后血清脂质浓度的变化 ($\bar{x} \pm S$)

组别	例数	血清脂质浓度 (mg/100ml)			
		TC	HDL-C	HDL ₂ -C	HDL ₃ -C
对照组	82	157.5 $\pm$ 3.07	51.06 $\pm$ 0.85	31.35 $\pm$ 0.69	19.48 $\pm$ 0.63
糖尿病组 治前	65	177.0 $\pm$ 5.09*	45.50 $\pm$ 1.30*	31.98 $\pm$ 0.89 Δ	13.61 $\pm$ 0.78°
糖尿病组 治后	41	183.0 $\pm$ 6.25	45.47 $\pm$ 1.37	32.08 $\pm$ 1.01	13.39 $\pm$ 0.85
	41	172.4 $\pm$ 4.66**	46.82 $\pm$ 1.84**	30.32 $\pm$ 1.23 Δ	17.13 $\pm$ 1.11°

*与对照组比, $P < 0.001$; **与治疗前比较, TC及HDL-C的P值分别 < 0.025 及 > 0.05 ; Δ 中药治疗前与对照组比及治疗前后比较, P值均 > 0.05 ; °中药治疗前与对照组比及治疗前后比较, P值均 < 0.001

三、血清脂质浓度: 65例糖尿病患者进行了血清脂质浓度测定, 其中41例作了中药天寿液治疗前比较, 结果见表3。

表3显示糖尿病患者TC浓度明显高于对照组, 而HDL-C浓度则明显低于对照组($P < 0.001$)。天寿液治疗半年后, 41例患者的TC浓度明显下降, HDL-C浓度无显著变化; HDL₂-C浓度糖尿病组与对照组之间差异不明显, 治疗后也无显著变化; 而糖尿病患者的HDL₃-C浓度在天寿液治疗前明显低于正常对照组, 中药治疗半年后, HDL₂-C水平明显升高, 治疗前后比较, 上升值具有非常显著性意义($P < 0.001$)。

讨 论

中医学认为糖尿病可由饮食不节、情志失调、性欲失度而诱发, 其病因皆基于“阴虚”与“燥热”, 发病机制为“阴虚火旺”, 故本病是“阴虚”为本, “燥热”为标, 两者互为因果。本组病例的中医辨证多属阴虚内热型, 口渴多饮, 溲频而多, 善食而瘦; 部分病例伴并发症者兼有阳虚脾弱或血瘀气滞证, 故拟方以养阴、益气、生津、调脂和降糖等作用的天寿液治疗。

细胞膜脂区流动性与细胞的许多生理功能如膜的通透性、膜上酶的活性、激素受体功能及葡萄糖和氧的运送等有关。研究膜的流动性有助于阐明某些疾病的发病机制和评价药物疗效^[3]。本组结果显示Ⅱ型糖尿病患者的红细胞膜脂区流动性明显降低, P及 η 明显大于对照组。在原有降糖药基础上加用中药天寿液治疗半年, P及 η 明显降低, 提示天寿液可提高细

胞膜流动性,从而改善了患者的血液高粘滞性⁽⁴⁾,有利于减少或预防心、脑血管系统和神经病变等并发症的发生。

人体代谢有赖于ATP水解提供能量,而体内产热的变化在很大程度上与细胞膜钠泵活性有关⁽⁵⁾。本组结果显示Ⅱ型糖尿病患者的红细胞钠泵活性低于对照组,提示本病为一种慢性消耗性疾病,能量消耗增加。天寿液治疗半年后钠泵活性尚未能恢复正常,此可能与本组部分病员年龄偏大、病程偏长,阴虚内热之中兼夹阳虚、气虚之证,且中药治疗时间较短,尚难使之恢复,有待继续随访。

心血管系统疾病为糖尿病的严重并发症之一,其发病与血清脂质代谢有密切关系,尤其是高密度脂蛋白胆固醇亚组分 HDL₂-C 浓度的降低是引起冠心病的危险因素之一,高脂状态可使细胞膜微粘度增加⁽⁶⁾。本组Ⅱ型糖尿病患者天寿液治疗半年后,血清TC浓度明显下降。HDL₂-C 水平较治疗前有明显提高,说明天寿液治疗具有调节脂质代谢的作用。本组病例单用降糖药治疗时空腹血糖均值在200mg%左右,加用天寿液治疗半年,血糖均值降至154mg%,其中17例血糖浓度<130mg%,同时临床症状和心血管及周围神经病变等并发症

有明显改善。

结果显示,中药天寿液是通过改善糖尿病患者的细胞膜活性功能和能量代谢,提高血清 HDL₂-C 水平和降低血清 TC 及血糖浓度等作用而发挥其治疗效应的。并提示细胞膜脂区流动性、钠泵活性、血脂和血糖浓度之间在糖尿病的发病机制中互相间有非常密切的关系。

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• 书 讯 •

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(本刊讯)

Abstracts of Original Articles

Study of Tian-Shou Liquor(天寿液) on Activity of Cell Membrane and Energy Metabolism in Diabetes Mellitus

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The research of Chinese medicine Tian-Shou Liquor(TSL) on the fluidity of the membrane lipid regions of intact erythrocyte (showed by microviscosity, $\bar{\eta}$), the activity of sodium pump of red cell, the plasma lipid level and sugar concentration in 65 cases of diabetes mellitus were determined before the treatment and a half year after the treatment. 82 normal cases were studied as a control group. The results showed that the diabetic group had an obviously lower fluidity of erythrocyte membrane and activity of sodium pump of red cell than those of normal groups ($P < 0.001$). The microviscosity of 27 diabetes patients treated by TSL were markedly decreased when compared with before treatment ($P < 0.01$). The changes of activity of sodium pump had no significant difference before and after treatment with TSL. According to the determination of plasma lipid, it was discovered that the total cholesterol concentration and HDL₂-C level in diabetes patients were obviously higher and lower than those of normal groups respectively ($P < 0.001$). One-half Year after treatment, the patients' cholesterol concentration had significantly decreased, but the HDL₂-C level were markedly raised by means of comparison between before and after treatment. Blood sugar concentration of 43 cases with TSL treatment decreased evidently ($P < 0.001$).

(Original article on page 455)

Clinical Study on Deficiency Syndrome of Chronic Gastritis

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161 cases of chronic gastritis (including 59 superficial gastritis, 86 atrophic gastritis, 16 superficial gastritis combined with atrophic gastritis) typed in deficiency syndrome (including 64 Spleen-deficiency syndrome, 97 Spleen-Kidney-deficiency syndrome) were studied clinically with modern medicinal multiple-index. The gastroscope image, pathologic changes of gastric mucosa, stomach barium meal examination, gastric acid, serum gastrin, urine pepsinogen, urine 17-ketosteroid, vegetative nerve function, peripheral blood picture, etc. were selected as observation indices. The preliminary findings showed that in Spleen-deficiency patients, the superficial gastritis constituted the majority, the asthenic stomach constituted the minority, the gastric secretion and the serum gastrin were on the high side, the urine pepsinogen, the adrenocortical function and the hemoglobin were on the low side, but the white blood cell was rather normal; otherwise, in Spleen-Kidney deficiency patients, the atrophic gastritis and the asthenic stomach constituted the majority, the gastric secretion decreased, the serum gastrin level was higher, while the urine pepsinogen, the adrenocortical function, white blood cell and the hemoglobin were on the low side. It was also found that in certain same inflammation changes, the gastric secretion of the Spleen-Kidney-deficiency syndrome was markedly than that of Spleen-deficiency syndrome. With the treatment method of invigorating the Spleen and reinforcing the Spleen-Kidney, each index was relatively improved. The degree of seriousness to inflammation changes of gastric mucosa and the disturbance or imbalance of gastric secretion function were reflected from the Spleen-deficiency and the Spleen-Kidney-deficiency syndromes of chronic gastritis. It is suggested that hemopoiesis and hypothalamo-adrenohypophysial-adrenal cortical axis be influenced.

(Original article on page 458)

The Relationship Between Endoscopy, Radionuclide Scintigraphy and TCM Types in 39 Patients with Reflux Esophagitis

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Histological biopsy and radionuclide scintigraphy (RNS) were carried out in 39 patients with symptoms and esophagoscopy evidence of gastroesophageal reflux disease. The detective rates were 84% and 79% respectively. The mechanism were discussed. There was no correlation between histological changes, RNS and clinical TCM types based on the theory of TCM.

(Original article on page 461)