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2 型糖尿病患者中医证型与糖脂代谢和甲状腺功能的关系 *

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摘要 目的：探讨 2 型糖尿病患者中医证型与糖脂代谢和甲状腺功能的关系。**方法：**选择 2016 年 1 月 -2017 年 12 月期间武警宁夏总队医院收治的 2 型糖尿病患者 104 例，根据中医证型将其分为湿热困脾组 23 例、阴虚热盛组 21 例、气阴两虚组 20 例、阴阳两虚组 22 例与血瘀脉络组 18 例。检测并对比不同中医证型 2 型糖尿病患者糖脂代谢与甲状腺功能指标水平。**结果：**阴虚热盛组、气阴两虚组、阴阳两虚组与血瘀脉络组甘油三酯（TG）、总胆固醇（TC）、低密度脂蛋白胆固醇（LDL-C）水平低于湿热困脾组，高密度脂蛋白胆固醇（HDL-C）水平高于湿热困脾组（P<0.05）；阴阳两虚组 TG、TC、LDL-C 水平低于阴虚热盛组、气阴两虚组、血瘀脉络组（P<0.05）。湿热困脾组、气阴两虚组、阴阳两虚组与血瘀脉络组空腹血糖（FPG）、餐后 2h 血糖（2hPPG）、糖化血红蛋白（GHb）水平低于阴虚热盛组（P<0.05）。湿热困脾组、阴虚热盛组、气阴两虚组、血瘀脉络组游离甲状腺素（FT4）、游离三碘甲状腺原氨酸（FT3）水平高于阴阳两虚组，促甲状腺激素（TSH）水平低于阴阳两虚组（P<0.05），各组总甲状腺素（TT4）、总三碘甲状腺原氨酸（TT3）水平总体比较差异无统计学意义（P>0.05）。**结论：**糖脂代谢和甲状腺功能能够在一定程度上反映出 2 型糖尿病患者的中医证型变化，可作为 2 型糖尿病患者中医证型与病情变化的有效参考指标。

关键词：2 型糖尿病；中医证型；血糖；血脂；甲状腺功能；关系

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Relationship between TCM Syndrome Types and Glycolipid Metabolism and Thyroid Function in Patients with type 2 Diabetes Mellitus*

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ABSTRACT Objective: To analyze the relationship between TCM syndrome type and glycolipid metabolism and thyroid function in type 2 diabetic patients. **Methods:** 104 cases of type 2 diabetes mellitus who were treated in Armed Police Corps Hospital of Ningxia from January 2016 to December 2017 were selected. According to TCM syndrome type, they were divided into dampness heat and spleen deficiency group with 23 cases, yin deficiency and heat accumulation group with 21 cases, deficiency of Qi and Yin group with 20 cases, Yin Yang deficiency group with 22 cases and blood stasis syndrome group with 18 cases. The glycolipid metabolism and thyroid function indexes in patients with type 2 diabetes mellitus with different TCM Syndromes were detected and compared. **Results:** The Triglyceride (TG), total cholesterol (TC) and low density lipoprotein cholesterol (LDL-C) levels in yin deficiency and heat accumulation group, deficiency of Qi and Yin group, Yin Yang deficiency group, blood stasis syndrome group were lower than those in the dampness heat and spleen deficiency group, the high density lipoprotein cholesterol (HDL-C) level was higher than that in the dampness heat and spleen deficiency group (P<0.05). The levels of TG, TC and LDL-C in Yin Yang deficiency group were lower than those in Yin deficiency and heat accumulation group, deficiency of Qi and Yin group and blood stasis syndrome group (P<0.05). The fasting blood glucose (FPG), postprandial 2H blood glucose (2hPPG) and glycosylated hemoglobin (GHb) level in dampness heat and spleen deficiency group, deficiency of Qi and Yin group, Yin Yang deficiency group and blood stasis syndrome group were lower than those in the yin deficiency and heat accumulation group(P<0.05). The free thyroxine (FT4) and free three iodine thyroxine (FT3) level in the dampness heat and spleen deficiency group, yin deficiency and heat accumulation group, deficiency of Qi and Yin group and blood stasis syndrome group were lower than those in Yin Yang deficiency group (P<0.05). There was no significant difference in total thyroxine (TT4) and total three iodide thyroid (TT3) levels in each group (P>0.05). **Conclusion:** Glycolipid metabolism and thyroid function can reflect the changes of TCM syndromes in patients with type 2 diabetes. It can be used as an effective reference index for TCM syndromes and changes of type 2

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diabetes mellitus.

Key words: Type 2 diabetes mellitus; TCM syndrome type; Blood sugar; Blood lipid; Thyroid function; Relationship

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前言

2 型糖尿病是一组以高血糖为主要特征的遗传代谢性疾病，主要因胰岛素分泌异常、糖脂代谢紊乱所致[1,2]。近年来，随着人们生活水平的提高以及饮食结构的变化，2 型糖尿病的发病率也不断升高[3,4]。流行病学研究发现，2 型糖尿病合并甲状腺功能异常的概率约高出非糖尿病者 2-3 倍[5,6]。从中医角度来看，2 型糖尿病属于消渴范畴，患者因消渴日久、阴损及阳、热灼津亏，导致络脉淤阻，其病机在于燥热阴虚，其中瘀与痰症贯穿始终[7,8]。甲状腺疾病也是一种常见的内分泌疾病，患者因以甲状腺激素分泌失调而表现出代谢紊乱，中医将甲状腺疾病纳入瘿病范畴，患者多因情志内伤、水土失宜等致使痰凝、气滞、血瘀[9,10]。2 型糖尿病与甲状腺疾病中均有瘀与痰等因素，提示两种疾病的发生、发展具有一定的相关性。本文通过研究 2 型糖尿病患者中医证型与糖脂代谢和甲状腺功能的关系，旨在为 2 型糖尿病患者中医证型研究提供客观化的依据，现作如下报道。

1 资料与方法

1.1 一般资料

选择 2016 年 1 月 -2017 年 12 月期间武警宁夏总队医院收治的 2 型糖尿病患者 104 例，根据中医证型将其分为湿热困脾组 23 例、阴虚热盛组 21 例、气阴两虚组 20 例、阴阳两虚组 22 例与血瘀脉络组 18 例。湿热困脾组：男 12 例，女 11 例；年龄 36-75 岁，平均（54.53± 5.34）岁；病程 2 年 -15 年，平均（7.53± 1.87）年。阴虚热盛组：男 11 例，女 10 例；年龄 38-76 岁，平均（53.45± 4.23）岁；病程 2 年 -16 年，平均（6.81± 1.53）年。气阴两虚组：男 10 例，女 10 例；年龄 37-72 岁，平均（52.51± 2.84）岁；病程 2 年 -18 年，平均（7.19± 1.26）年。阴阳两虚组：男 11 例，女 11 例；年龄 38-74 岁，平均（53.82± 3.41）岁；病程 2 年 -18 年，平均（7.82± 1.38）年。血瘀脉络组：男 10 例，女 8 例；年龄 37-75 岁，平均（54.21± 3.08）岁；病程 2 年 -17 年，平均（7.43± 1.23）年。在性别、年龄、病程构成对比中，五组患者比较差异无统计学意义（P>0.05），均衡可比。本次研究经医院伦理委员会审核批准，且研究内容已告知患者，并签署知情同意书。

1.2 纳入标准与排除标准

纳入标准：① 患者符合中华医学会糖尿病学分会制定的《中国 2 型糖尿病防治指南（2013 年版）》相关诊断标准[11]，即空腹血糖（fasting plasma glucose，FPG）≥ 7.0 mmol/L，餐后 2h 血糖（2h-postprandial plasma glucose，2hPPG）≥ 11.1mmol/L，糖化血红蛋白（glycosylated hemoglobin，GHb）≥ 6.5%；患者伴有典型高血糖症状或高血糖危象，血糖随机检测指标≥ 11.1mmol/L。② 中医诊断与辨证符合 2002 年《中药新药临床研究》[12]中对湿热困脾、阴虚热盛、气阴两虚、阴阳两虚与血瘀脉络五型的诊断标准，即主症 2 项，或次症 2 项、主症 1 项，且由两名主治医师行脉证合参，并结合脉象舌象诊断，综合辨证一致后确定证型。③ 患者病历资料完整；④ 患者及家属对研究知情同意，签署知情同意书。排除标准：① 哺乳期与妊娠期女性；② 伴有其他严重疾病，例如心脑血管疾病、恶性肿瘤、尿毒症等；③ 1 个月内发生过急性代谢紊乱，例如糖尿病酮症酸中毒等；④ 合并急慢性感染者；⑤ 有精神疾病史者。

1.3 方法

晨起空腹状态下采集五组患者空腹外周静脉血 5 mL，在低温下经 3500 r/min 离心 10 min，分离血清，通过日立 5300 s 全自动生化分析仪检测甘油三酯（triglyceride，TG）、总胆固醇（total cholesterol，TC）、低密度脂蛋白胆固醇（low density lipoprotein cholesterol，LDL-C）、高密度脂蛋白胆固醇（high density lipoprotein cholesterol，HDL-C）、FPG、2hPPG 与 GHb 水平；通过罗氏 T210 全自动化学发光免疫检测设备检测甲状腺功能指标促甲状腺激素（thyroid stimulating hormone，TSH）、总甲状腺素（total thyroxine，TT4）、游离甲状腺素（free thyroxine，FT4）、总三碘甲状腺原氨酸（total triiodothyroxine，TT3）与游离三碘甲状腺原氨酸（free triiodothyronine，FT3）的水平。

1.4 统计学方法

本研究数据均采用 SPSS21.0 进行分析，所有数据均符合正态分布，计量资料以（$\bar{x}\pm s$）表示，多组数据比较应用单因素方差分析，两组间对比实施 t 检验，计数资料以率表示，组间对比实施 x^2 检验，检验水准 α=0.05。

2 结果

2.1 不同中医证型 2 型糖尿病患者的血脂代谢水平对比

各组 TG、TC、LDL-C、HDL-C 水平总体比较差异无统计学意义（P>0.05）；阴虚热盛组、气阴两虚组、阴阳两虚组与血瘀脉络组 TG、TC、LDL-C 水平低于湿热困脾组，HDL-C 水平高于湿热困脾组（P<0.05）；阴阳两虚组 TG、TC、LDL-C 水平低于阴虚热盛组、气阴两虚组、血瘀脉络组（P<0.05），阴虚热盛组、气阴两虚组、血瘀脉络组三组间血脂代谢水平比较无统计学意义（P>0.05），见表 1。

2.2 不同中医证型 2 型糖尿病患者的血糖代谢水平对比

各组 FPG、2hPPG 水平总体比较差异有统计学意义（P<0.05），各组 GHb 水平总体比较差异无统计学意义（P>0.05）；湿热困脾组、气阴两虚组、阴阳两虚组与血瘀脉络组 FPG、2hPPG、GHb 水平低于阴虚热盛组（P<0.05）；湿热困脾组、气阴两虚组、阴阳两虚组与血瘀脉络组四组间血糖代谢水平比较无统计学意义（P>0.05）。见表 2。

2.3 不同中医证型 2 型糖尿病患者的甲状腺功能指标对比

各组 TSH、TT4、FT4、TT3、FT3 水平总体比较差异无统计学差异（P>0.05）；湿热困脾组、阴虚热盛组、气阴两虚组、血瘀脉络组 FT3、FT4 水平高于阴阳两虚组，TSH 水平低于阴阳两虚组（P<0.05）；湿热困脾组、阴虚热盛组、气阴两虚组、血瘀脉络组四组间甲状腺功能水平比较无统计学意义（P>0.05），见表 3。

表 1 不同中医证型 2 型糖尿病患者的血脂代谢水平对比(mmol/L,$\bar{x}\pm s$)

Table 1 Comparison of blood lipid metabolism in patients with type 2 diabetes mellitus with different TCM Syndromes(mmol/L, $\bar{x}\pm s$)

Groups	n	TG	TC	LDL-C	HDL-C
Dampness heat and spleen deficiency group	23	2.29± 0.47	4.68± 0.63	3.45± 0.92	1.03± 0.38
Yin deficiency and heat accumulation group	21	1.63± 0.24[ab]	4.06± 0.49[ab]	2.82± 0.72[ab]	1.42± 0.11[a]
Deficiency of Qi and Yin group	20	1.64± 0.31[ab]	4.03± 0.57[ab]	2.78± 0.68[ab]	1.40± 0.15[a]
Yin Yang deficiency group	22	1.32± 0.20[a]	3.64± 0.42[a]	2.31± 0.65[a]	1.42± 0.25[a]
Blood stasis syndrome group	18	1.59± 0.32[ab]	4.17± 0.51[ab]	2.76± 0.55[ab]	1.38± 0.22[a]
F		6.993	5.965	5.856	4.853
P		0.072	0.081	0.101	0.201

Note: compared with dampness heat and spleen deficiency group, [a]P<0.05, compared with Yin Yang deficiency group, [b]P<0.05.

表 2 不同中医证型 2 型糖尿病患者的血糖代谢水平对比($\bar{x}\pm s$)

Table 2 Comparison of blood glucose metabolism in patients with type 2 diabetes mellitus with different TCM syndromes($\bar{x}\pm s$)

Groups	n	FPG(mmol/L)	2hPPG(mmol/L)	GHb(%)
Dampness heat and spleen deficiency group	23	7.45± 2.52[a]	13.10± 1.52[a]	7.03± 0.85[a]
Yin deficiency and heat accumulation group	21	11.30± 2.85	15.68± 1.65	8.90± 1.06
Deficiency of Qi and Yin group	20	7.55± 3.02[a]	12.75± 1.85[a]	7.52± 1.20[a]
Yin Yang deficiency group	22	8.02± 3.05[a]	13.42± 1.25[a]	7.35± 0.85[a]
Blood stasis syndrome group	18	8.16± 3.25[a]	12.36± 1.20[a]	7.66± 1.45[a]
F		10.658	9.623	6.782
P		0.043	0.041	0.085

注:与阴虚热盛组对比,[a]P<0.05。

Note: Compared with Yinyin Hot Group, [a]P<0.05.

表 3 不同中医证型 2 型糖尿病患者的甲状腺功能指标对比($\bar{x}\pm s$)

Table 3 Comparison of thyroid function indexes in patients with type 2 diabetes mellitus with different TCM Syndromes($\bar{x}\pm s$)

Groups	n	TSH(uIU/mL)	TT4(ug/dL)	FT4(ng/dL)	TT3(ng/mL)	FT3(pg/mL)
Dampness heat and spleen deficiency group	23	2.60± 1.12[a]	9.08± 2.02	1.16± 0.21[a]	1.03± 0.30	2.76± 0.46[a]
Yin deficiency and heat accumulation group	21	2.58± 1.04[a]	9.17± 2.08	1.17± 0.23[a]	1.04± 0.28	2.82± 0.45[a]
Deficiency of Qi and Yin group	20	2.57± 1.10[a]	8.85± 1.76	1.16± 0.22[a]	1.02± 0.25	2.77± 0.37[a]
Yin Yang deficiency group	22	5.22± 1.36	8.50± 2.04	0.91± 0.17	0.96± 0.24	1.97± 0.32
Blood stasis syndrome group	18	2.52± 1.32[a]	8.46± 2.20	1.16± 0.25[a]	1.02± 0.21	2.65± 0.33[a]
F		5.852	4.845	2.887	2.425	2.782
P		0.087	0.254	0.515	0.458	0.645

Note: compared with the Yin yang imaginary groups, [a]P<0.05.

3 讨论

2 型糖尿病是危害人们健康的常见慢性疾病，已有研究证实,该病是导致心脑血管疾病的独立危险因素[13,14]。有学者发现,2 型糖尿病与载脂蛋白、血脂密切相关,可进一步诱发血脂代谢紊乱[15,16]。3 羟基 3 甲基戊二酸单酰辅酶 A 还原酶(3hydroxy3-methylglutaryl coenzyme-A reductase,HMGR)是胆固醇合成限速酶，而 2 型糖尿病患者受长期高血糖的影响,增加了肝脏的 HMGR 活性,随之提高了胆固醇合成作用,继而诱发血脂代谢紊乱[17,18]。血脂异常是指血浆内三酰甘油或胆固醇升高,脂质沉积于血管内皮下,诱发动脉粥样硬化,继而导致心脑血管与四周血管病变[19,20]。有学者认为,糖尿病治疗不可单纯以降低血糖水平作为最终目标，而是应将合理调控血脂水平,提高胰岛功能作为治疗的新思路[21,22]。同时,部分研究发现中医在调节血脂代谢,提高胰岛素敏感性等方面具有独特的优势[23]。

中医认为,2 型糖尿病属于消渴病范畴，根据证型可分为湿热困脾、阴虚热盛、气阴两虚、阴阳两虚与血瘀脉络五种[24]。这五种类型疾病发病机制不同、脏腑辩证不同,治疗方法上也存在一定差异。本研究结果显示,湿热困脾组 TG、TC、LDL-C 水平较高,HDL-C 水平较低,这可能与湿热困脾患者大多存在

饮食不规律有关。由于湿热困脾患者喜食荤腥、肥甘厚味，体形肥胖，致使中焦运化不利，脾胃受损，水谷无法化为精微，湿性黏膜，聚湿成痰，易于气郁化热，阻滞气机，故发为湿热困脾之证。同时湿热困脾患者长期喜食荤腥、肥甘厚味致使 TG、TC、LDL-C 水平升高。而阴阳两虚患者大多属于消渴症后期，随着病情进展，患者形体消瘦，津亏液耗，营养失调，故而 TG、TC、LDL-C 水平降低。

从血糖指标来看，湿热困脾组、气阴两虚组、阴阳两虚组与血瘀脉络组 FPG、2hPPG、GHb 水平低于阴虚热盛组。阴虚热盛患者津液损耗严重，热愈盛越伤阴，多尿、多饮症状越为严重，糖代谢也随之发生紊乱，所以血糖明显升高。有研究发现，甲状腺功能正常的 2 型糖尿病患者，其 FT3 与 GHb 呈负相关[25,26]。还有学者指出，血糖控制不佳的 2 型糖尿病患者，随着病情转复，FT3 指标也见明显回升，说明甲状腺指标 FT3 与糖尿病严重度与血糖控制效果有关[27]。本文分析了不同中医证型的甲状腺功能指标，湿热困脾组、阴虚热盛组、气阴两虚组、血瘀脉络组 FT3、FT4 水平高于阴阳两虚组，TSH 水平低于阴阳两虚组，此结果与既往研究结果相符[28]。消渴证发热主要以燥热为标，阴虚为本，阴阳失衡。发病初期，湿热困脾证或阴虚热盛证型患者病情轻、病程短，无明显病损，此时正气尚盛，精气未衰，阳气相对偏亢，FT3 与 FT4 无明显变化[29]。气阴两虚证患者病情重、病情较长，且易伴发不同程度的关发症，可致阴损及阳，阳气不足，阴阳两虚，则降低了甲状腺激素水平，即 FT3 与 FT4 降低，TSH 上升[30]。阴阳两虚型患者病程长，且部分已处于疾病终末期，FT3 与 FT4 随虚损加重而降低的更为明显。可见，2 型糖尿病患者甲状腺激素分泌异常，不同中医证型 2 型糖尿病患者甲状腺激素分泌存在一定差异。

综上所述，不同中医证型的 2 型糖尿病患者糖脂代谢存在一定区别，糖脂代谢和甲状腺功能能够在一定程度上反映出 2 型糖尿病转归、轻重与中医各证型的变化。

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