

doi: 10.13241/j.cnki.pmb.2014.18.022

老年高血压合并 2 型糖尿病患者血清同型半胱氨酸、血尿酸水平变化及临床意义

陈 荷 赵月萍 李 茂 蒋文娟 魏贵红

(四川省宜宾市第一人民医院内分泌科 四川 宜宾 644000)

摘要 目的:探讨老年高血压合并 2 型糖尿病患者血清同型半胱氨酸(Homocysteine, Hcy)、血尿酸(Serum uric acid, SUA)水平变化及其临床意义。**方法:**2012 年 9 月至 2013 年 9 月期间,我院诊治的 40 例单纯高血压和 40 例高血压合并 2 型糖尿病患者,分别作为对照组和研究组,检测两组血清 Hcy、SUA 水平。**结果:**两组患者收缩压、舒张压比较无统计学差异($P>0.05$)。研究组空腹血糖、餐后 2h 血糖、血清 Hcy、SUA 均显著高于对照组($P<0.05$)。研究组中血管并发症患者血清 Hcy、SUA 为(25.0 ± 5.0) $\mu\text{mol/L}$ 和(390.0 ± 65.0) mmol/L 显著高于无血管并发症患者(17.0 ± 4.0) $\mu\text{mol/L}$ 和(330.0 ± 55.0) mmol/L ,血管并发症患者 FBG、餐后 2h 血糖与无血管并发症患者比较无统计学差异($P>0.05$)。**结论:**高血压合并 2 型糖尿病患者血清 Hcy、SUA 异常升高,且存在慢性血管并发症患者两者水平更高,血清 Hcy、SUA 是老年高血压合并 2 型糖尿病的危险因素。

关键词:高血压;2 型糖尿病;同型半胱氨酸;尿酸

中图分类号:544.1;R587.1 文献标识码:A 文章编号:1673-6273(2014)18-3487-03

The Levels Change and Clinical Significance Research of Serum Homocysteine and Uric Acid for Old Patients with Hypertension and Type 2 Diabetes

CHEN He, ZHAO Yue-ping, LI Mao, JIANG Wen-juan, WEI Gui-hong

(Department of Endocrinology, Yibin First People's Hospital of Sichuan Province, Yibin, Sichuan, 644000, China)

ABSTRACT Objective: To study the levels change and relationship of serum homocysteine (Hcy) and uric acid (UA) for old patients with hypertension and type 2 diabetes. **Methods:** The 40 patients with hypertension and 40 patients with hypertension and type 2 diabetes in our hospital during the period from Sep 2012 to Sep 2013 were regarded as the subjects of the control group and the study group. The levels of serum homocysteine and uric acid in the two groups and the relationship were measured and compared. **Results:** The systolic blood pressure, diastolic blood pressure of two groups was not statistically significant ($P>0.05$). In study group, fasting blood glucose, 2h postprandial blood glucose, serum Hcy, SUA were significantly higher than those in the control group ($P<0.05$). To observe the vascular complications in patients serum Hcy, SUA were (25.0 ± 5.0) $\mu\text{mol/L}$ and (390.0 ± 65.0) mmol/L significantly higher than that (17.0 ± 4.0) $\mu\text{mol/L}$ and (330.0 ± 55.0) mmol/L of patients without vascular complications, there were no statistical differences in 2h glucose, FBG postprandial vascular complications in patients with and without vascular complications in patients with ($P>0.05$). **Conclusion:** The serum homocysteine and uric acid are the risk factors for old patients with hypertension and type 2 diabetes.

Key words: Hypertension; Type 2 diabetes; Homocysteine; Uric acid

Chinese Library Classification(CLC): 544.1; R587.1 **Document code:** A

Article ID: 1673-6273(2014)18-3487-03

前言

高血压、糖尿病是威胁老年人身体健康的常见疾病,近年来患病数逐渐升高^[1]。且高血压患者常常并发糖尿病,糖尿病患者也容易并发高血压,两者相互影响,加重疾病的发展。由于两种疾病均可对血管产生慢性损害,常被称为同源性疾病,高血压合并 2 型糖尿病可能引发严重心血管疾病,甚至危及生命^[2]。清楚了解高血压合并 2 型糖尿病的危险因素,对于 2 型糖尿病二级预防和疾病诊断具有重要意义。本研究中,单纯高血压与

老年高血压合并 2 型糖尿病患者的血清同型半胱氨酸(homocysteine, Hcy)、血尿酸(uric acid, UA)水平,并探讨其临床意义,有助于老年高血压合并 2 型糖尿病患者的防治,现报道如下,以供临床参考。

1 资料和方法

1.1 一般资料

选择 2012 年 9 月至 2013 年 9 月期间,我院诊治的 40 例高血压合并 2 型糖尿病患者作为研究组,所有患者均符合 WHO 关于高血压和 / 或 2 型糖尿病的诊断标准^[3],并排除严重心力衰竭、心肌梗死、心律失常等疾病患者。研究组:男性患者 22 例、女性患者 18 例,年龄 65.5~86.0,平均年龄(67.0 ± 5.5)

作者简介:陈荷(1973-),女,本科,主治医师,从事糖尿病及其各种并发症方面的研究,E-mail: 983441262@qq.com

(收稿日期:2013-11-25 接受日期:2013-12-22)

岁。同期诊治的 40 例单纯高血压患者座位对照组, 男性患者 23 例、女性患者 17 例, 年龄 66.0~87.0, 平均年龄 (68.0± 6.0) 岁。两组性别、年龄比较, 差异无统计学意义 ($P>0.05$), 具有可比性。

1.2 方法

所有受试者清晨空腹抽取肘静脉血约 5 mL, 3000 r/min 离心分离血清, 应用酶联免疫吸附法检测两组对血清 Hcy 水平, 日立 7600 型全自动生化分析仪, 检测 UA 水平, 空腹血糖、餐后 2h 血糖水平。并检测两组静息状态血压。试剂盒分别购自北京利德曼公司和德国罗氏公司。根据患者有无糖尿病血管并发症将观察组患者分为两组, 血管并发症包括: 冠心病、脑血管病、糖尿病肾病、视网膜病变。比较各组血清 Hcy、SUA、血糖、

空腹血糖、餐后 2 h 血糖及血压水平。

1.3 统计学方法

数据采用 SPSS18.0 统计学软件进行分析和处理, 计量资料以 ($\bar{x} \pm s$) 表示, 经 Kolmogorov-Smirnow Normality 检验, 方差齐者, 采用 t 检验, $P<0.05$, 差异有统计学意义。

2 结果

2.1 观察组与对照组观察指标比较

两组患者收缩压、舒张压比较无统计学差异 ($P>0.05$)。观察组空腹血糖、餐后 2 h 血糖、血清 Hcy、SUA 均显著高于对照组 ($P<0.05$)。见表 1

表 1 研究组与对照组观察指标比较 ($\bar{x} \pm s$)

Table 1 Comparison of observed indicator of two groups ($\bar{x} \pm s$)

组别 Groups	n	Hcy ($\mu\text{mol/L}$)	UA (mmol/L)	收缩压 systolic pressure (mmHg)	收缩压 systolic pressure (mmHg)	空腹血糖 fasting blood-glucose (mmol/L)	餐后 2h 血糖 2h postprandial blood glucose (mmol/L)
研究组 Study group	40	20.4± 5.3	350.8± 65.3	154.3± 25.7	96.0± 12.2	6.3± 0.4	13.0± 2.5
对照组 Control group	40	13.5± 4.7	278.1± 55.2	150.8± 25.7	95.0± 11.6	4.5± 0.6	6.7± 0.5
t		2.845	3.593	0.081	0.043	2.287	2.315
P		<0.05	<0.01	>0.05	>0.05	<0.05	<0.05

2.2 观察组中有无血管并发症患者观察指标比较

观察组患者合并冠心病 5 例, 脑梗死 2 例, 糖尿病肾病 3 例, 糖尿病视网膜病变患者 2 例。研究组中血管并发症患者血清 Hcy、SUA 为 (25.0± 5.0) $\mu\text{mol/L}$ 和 (390.0± 65.0) mmol/L 显

著高于无血管并发症患者 (17.0± 4.0) $\mu\text{mol/L}$ 和 (330.0± 55.0) mmol/L , 血管并发症患者 FBG、餐后 2h 血糖与无血管并发症患者比较无统计学差异 ($P>0.05$)。见表 2。

表 2 观察组中有无血管并发症患者观察指标比较 ($\bar{x} \pm s$)

Table 2 Comparison of observed indicator of observation group with and without vascular complication ($\bar{x} \pm s$)

组别 Groups	n	Hcy ($\mu\text{mol/L}$)	UA (mmol/L)	收缩压 systolic pressure (mmHg)	舒张压 diastolic pressure (mmHg)	空腹血糖 fasting blood-glucose (mmol/L)	餐后 2h 血糖 2h postprandial blood glucose (mmol/L)
有血管并发症 with vascular complication	12	25.0± 5.0	390.0± 65.0	155.8± 27.2	96.4± 12.1	6.5± 0.7	13.2± 2.1
无血管并发症 without vascular complication	28	17.0± 4.0	330.0± 55.0	153.6± 23.8	95.7± 12.3	6.2± 0.2	12.7± 1.7
t		2.832	3.127	0.075	0.048	0.087	0.105
P		< 0.05	< 0.05	> 0.05	> 0.05	> 0.05	> 0.05

3 讨论

高血压是临床上最常见的慢性疾病, 也是多种心脑血管疾病的重要发病因素和病因^[9]。目前, 我国高血压患病率已上升至 30%, 严重影响人们健康^[9]。尤其是老年人, 机体各项机能下降,

常同时患有多种慢性疾病, 给临床治疗带来了困难。目前研究发现^[9], 高血压与 2 型糖尿病有密切的关系, 两种疾病均可对血管产生慢性损害, 常被称为同源性疾病, 高血压合并 2 型糖尿病可能引发严重心血管疾病, 甚至危及生命。近年来研究发现^[7-9], 高同型半胱氨酸血症和高尿酸血症是动脉粥样硬化的危险因素

素,两者可能参与动脉硬化病变,在多种心脑血管疾病的发病中起到重要作用,同时还可能参与胰岛素抵抗,成为胰岛素抵抗综合征的病因之一。

Hcy 作为含硫氨基酸,是半胱氨酸、蛋氨酸的重要中间代谢产物^[10]。据报道,Hcy 升高时,与低密度脂蛋白结合,形成复合体,继而被吞噬细胞吞噬,形成泡沫细胞;Hcy 能够加速血管平滑肌细胞 DNA 合成,刺激血管平滑肌持续收缩,造成血管内皮细胞的损伤,继而造成血压升高、血管重建^[11-14];Hcy 急速升高,内皮细胞出现损伤,容易在血流中形成血栓;Hcy 升高时,血管内皮细胞炎性因子,尤其是肿瘤坏死因子受体上调,最终导致细胞凋亡。本研究中,与对照组相比,观察组 Hcy 水平明显升高,表明高血压合并 2 型糖尿病患者 Hcy 水平明显升高,Hcy 可能是老年高血压合并 2 型糖尿病的危险因素,推测高血压合并 2 型糖尿病患者 Hcy 水平升高可能与胰岛素缺乏有关^[15]。

SUA 作为嘌呤代谢终产物,是人体主要的内源性、水溶性的氧化剂。有报道称,高尿酸血症与胰岛素抵抗综合征,有密切的相关性^[16]。高尿酸血症患者的尿酸盐结晶于动脉壁沉淀,继而损伤动脉内膜;高血压患者常累及肾脏,肾小球动脉发生硬化,肾血流量减少,继而尿酸排泄量减少,容易形成血尿酸增加,最终导致高尿酸血症^[17-19]。本研究中观察组 UA 水平明显升高,其原因可能使 2 型糖尿病患者肾脏近曲小管对尿酸的重吸收被抑制,导致尿酸排泄量增多,继而患者出现系统性代谢紊乱,尿酸清除率相应降低,血尿酸水平也相应升高,另外,高尿酸血症会损害胰腺细胞,患者容易并发糖尿病^[20]。

本研究还在观察组中有无血管并发症进行了进一步的观察,结果显示观察组中血管并发症患者血清 Hcy、SUA 显著高于无血管并发症患者,血管并发症患者 FBG、餐后 2 h 血糖与无血管并发症患者比较无统计学差异。这表明血清 Hcy、SUA 对于预测血管并发症有重要的价值。目前,已有大量文献证实高血压、2 型糖尿病患者的 Hcy、UA 水平明显升高,也可以反映患者病情的严重程度^[21]。但本研究结果表明,做好血清 Hcy、UA 的检测,能够有效预防老年高血压、糖尿病,以及继发性心血管疾病的发生。这为高血压、2 型糖尿病患者疾病的发生、发展提供了理论依据,也为高血压合并 2 型糖尿病的防治工作,提供了针对性的临床预防作用。

参考文献(References)

- [1] 章志红,熊艳,杨泉珍,等.社区老年人群高血压患病现状[J].中国临床研究,2010,23(12):1173
Zhang Zhi-hong, Xiong Yan, Yang Quan-zhen, et al. The present situation of Chinese community elderly hypertension [J]. Chinese Journal of Clinical Research, 2010,23(12):1173
- [2] Abougambou SS, Abougambou AS, Sulaiman SA, et al. Prevalence of hypertension, control of blood pressure and treatment in hypertensive with type 2 diabetes in Hospital University Sains Malaysia[J]. Diabetes Metab Syndr, 2011,5(3):115-119
- [3] 中国高血压防治指南修订委员会.中国高血压防治指南 2010[J].中华心血管病杂志,2011,39(7):579-616
Writing Group of 2010 Chinese Guidelines for the Management of Hypertension.2010 Chinese guidelines for the management of hypertension[J].Chinese Journal of Cardiology,2011,39(7):579-616
- [4] Myers J. Automated IHC/ISH slide staining systems: current technologies and other considerations[J]. MLO Med Lab Obs, 2012, 44(7):48-50
- [5] Pang J, Salim A, Lee VJ, et al. Diabetes with hypertension as risk factors for adult dengue hemorrhagic fever in a predominantly dengue serotype 2 epidemic: a case control study [J]. PLoS Negl Trop Dis, 2012,6(5):1641
- [6] 陈斐娟.老年高血压并发糖尿病患者血同型半胱氨酸水平与颈动脉粥样硬化的关系[J].中国慢性病预防与控制,2013,21(3):361-363
Chen Fei-juan. The relationship between elderly patients with hypertension complicated with diabetes blood homocysteine level and carotid atherosclerosis [J]. Chinese Journal of Prevention and Control of Chronic Diseases, 2013,21(3):361-363
- [7] 姚家奎,柏斗胜,王翊,等.同型半胱氨酸检测对急性心肌梗死早期诊断临床价值的研究[J].实用临床医药杂志,2010,14(9):131-132
Yao Jia-kui, Bai Dou-sheng, Wang Yu, et al. Study on homocysteine detection in clinical value of early diagnosis of acute myocardial infarction [J]. Journal of Clinical Medicine in Practice, 2010,14(9): 131-132
- [8] 洪雁. 同型半胱氨酸与糖尿病合并缺血性血管疾病的研究进展[J].医学综述,2013,19(9):1644-1646
Hong Yan. Research Progress of the Homocysteine and Patients with Diabetes Mellitus and Ischemic Cerebrovascular Disease [J]. Medical Recapitulate, 2013,19(9):1644-1646
- [9] 马熙岳,刘伟,尹云佳.血浆同型半胱氨酸、超敏 C 反应蛋白与高血压合并糖尿病的相关性[J].航空航天医学杂志,2012,23(3):272-274
Ma Xi-yue, Liu Wei, Yin Yun-jia. The levels of plasma total homocysteine concentration and high -sensitivity C -reactive protein in hypertensive patients with diabetes [J]. Journal of Aerospace Medicine, 2012,23(3):272-274
- [10] 左小芹,代青湘.老年高血压合并 2 型糖尿病患者血尿酸、血清同型半胱氨酸水平及临床意义 [J]. 中国老年学杂志,2013,33(5): 1052-1053
Zuo Xiao-qin, Dai Qing-xiang. The uric acid, serum homocysteine levels and clinical significance of elderly patients with essential hypertension in patients with type 2 diabetes mellitus [J]. Chinese Journal of Gerontology, 2013,33(5):1052-1053
- [11] Li S, Wang C, Zhong XW, et al. Variance of mean platelet volume in subjects with normal glucose tolerance, impaired glucose regulation and type 2 diabetic mellitus and its relationship with diabetic peripheral artery disease [J]. National Medical Journal of China, 2012, 92(4):232-235
- [12] 唐红,郑建平,王丽,等.血清同型半胱氨酸水平与冠心病相关性的临床分析[J].现代生物医学进展,2012,12(34):6743-6745,6729
Tang Hong, Zheng Jian-ping, Wang Li, et al. The Clinical Analysis of Correlation of Serum Homocysteine Level with Coronary Heart Disease [J]. Progress in Modern Biomedicine, 2012,12(34):6743-6745, 6729
- [13] Lee SB, Huh PW, Kim DS, et al. Early superficial temporal artery to middle cerebral artery bypass in acute ischemic stroke[J]. Clin Neurol Neurosurg,2013,115(8):1238-1244

- Pu Xu-jin, Lv Wei, Huang He. Research on Psychological Fatigue of Knowledge Staff in Foreign-invested Enterprise: Empirecal Analysis from Bosch Automotive Diesel Systems Co [J]. Ltd. Chinese Journal of Ergonomics, 2003, 19(3): 12-17
- [3] 刘锡丹, 李建光, 连玉龙, 等. 驻干旱沙漠军人心理疲劳研究[J]. 解放军医院管理杂志, 2011, 18(02): 124-126
- Liu Xi-dan, Li Jian-guang, Lian Yu-long, et al. Research on Mental Fatigue of Soldiers in the Arid Desert [J]. Hosp Admin J Chin PLA, 2011, 18(02): 124-126
- [4] Boksem, M. A. S., Kostermans, E., Tops, M., et al. Individual differences in asymmetric resting-state frontal cortical activity modulate erps and performance in a global-local attention task [J]. Journal of Psychophysiology, 2012, 26(2): 51-62
- [5] R. Nicholas Nolte, Rex A. Wright, Crystal Turner, et al. Reported fatigue, difficulty, and cardiovascular response to a memory challenge [J]. International Journal of Psychophysiology, 2008, 69(1): 1-8
- [6] Boksem M. A. S., Meijman T. F., Lorist M. M. Effects of mental fatigue on attention: An ERP study [J]. Cognitive Brain Research, 2005, 25(1): 107-116
- [7] 高鹏程, 黄敏儿. 高特质焦虑的注意偏向特点 [J]. 心理学报, 2008, 40(3): 307-318
- Gao Peng-cheng, Huang Min-er. Attention to characteristics of high trait anxiety [J]. Acta Psychologica Sinica, 2008, 40(3): 307-318
- [8] 彭家欣, 杨奇伟, 罗跃嘉. 不同特质焦虑水平的选择性注意偏向[J]. 心理学报, 2013, 45(010): 1085-1093
- Peng Jia-xin, Yang Qi-wei, Luo Yue-jia. Selected Attentional Bias in Different Level of Trait Anxiety [J]. Acta Psychologica Sinica, 2013, 45(010): 1085-1093
- [9] Ruihua Hou, Rona Moss-Morris, Brendan Pet al. Attentional bias towards health-threat information in chronic fatigue syndrome [J]. Journal of Psychosomatic Research, 2008, 65: 47-50
- [10] Lavie N, Tsal Y. Perceptual load as a major determinant of the locus of selection in visual attention [J]. Perception & Psychophysics, 1994, 56(2): 183-197
- [11] David M, John E R. Mood congruent memory in Dysphasia: The roles of state affect and cognitive style [J]. Behavior Research and Therapy, 2006, 44(9): 1275-128
- [12] Trudie Chalder G, Berelowitz Teresa Pawlikowska, et al. Development of a fatigue scale [J]. Journal of Psychosomatic Research, 1993, 37(2): 147-153
- [13] Joormann J, Gotlib IH. Selective attention to emotional faces following recovery from depression [J]. J Abnorm Psychol, 2007, 116(1): 80-85
- [14] Maarten A.S. Boksem, Theo F. Meijman, Monique M. Lorist. Mental fatigue, motivation and action monitoring [J]. Biological Psychology, 2006, 72(01): 123-132
- [15] Liu J. P., Zhang C., Zheng C. X. EEG-based estimation of mental fatigue by using KPCA-HMM and complexity parameters [J]. Biomedical Signal Processing and Control, 2010, 5(2): 124-130
- [16] Jiang N, Sato T, Hara T, et al. Correlation between trait anxiety, personality and fatigue: study based on the Temperament and Character Inventory [J]. J Psychosom Res, 2003, 55(6): 493-500
- [17] Kaneko K., Sakamoto K. Spontaneous blinks as a criterion of visual fatigue during prolonged work on visual display terminals [J]. Perceptual and Motor Skills, 2001, 92(1): 234-250
- [18] 罗亚莉, 张大均. 高特质愤怒者对负性情绪刺激注意偏向的潜在机制 [J]. 中国临床心理学杂志, 2013, 21(002): 180-184
- Luo Ya-li, Zhang Da-jun. Potential Mechanism of High Trait Anger Individuals' Attentional Bias to Negative Emotional Stimuli [J]. Chinese Journal of Clinical Psychology, 2013, 21(002): 180-184
- [19] Sharon Eldar, Roni Yankelevitch, Dominique Lamy, et al. Enhanced neural reactivity and selective attention to threat in anxiety [J]. Biological Psychology, 2010, 76(07): 252-257
- [20] Carretie L, Mercado F, Tapia M, et al. Emotion, attention, and the 'negative bias', studied through event-related potentials [J]. International Journal of Psychophysiology, 2001, 62(41): 75-85
- [21] 朱诗敏, 郑希付. 短影片启动情绪对注意偏向的影响 [J]. 心理科学, 2009, 32(2): 327-330
- Zhu Shi-min, Zheng Xi-fu. Short film start mood to pay attention to the influence of the bias [J]. Psychological Science, 2009, 32(2): 327-330
- [22] Parrott WG, Sabini J. Mood and memory under natural condition: evidence for mood Incongruent recall [J]. Journal of Personality and Social Psychology, 1990, 59(2): 321-336

(上接第3489页)

- [14] 吕璘琳, 韩青, 孙芹敏, 等. 脑卒中患者血清同型半胱氨酸和半胱氨酸蛋白酶抑制剂 C 水平变化及临床意义探讨 [J]. 实用医学杂志, 2010, 26(21): 4000-4003
- Lv Lin-lin, Han Qing, Sun Qin-min, et al. Changes of cerebral stroke patients whose serum homocysteine and cystatin C levels and clinical significance [J]. The Journal of Practical Medicine, 2010, 26(21): 4000-4003
- [15] Nursalim A, Suryaatmadja M, Panggabean M. Potential clinical application of novel cardiac biomarkers for acute myocardial infarction [J]. Acta Med Indones, 2013, 45(3): 240-250
- [16] Afanas'ev IuI, Storozhenko Slu, Grigorova Slu. Potentialities of medicinal correction of cerebrovascular disturbances in patients with arterial hypertension [J]. Klin Med (Mosk), 2012, 90(6): 66-69
- [17] Duelsner A, Gatzke N, Glaser J, et al. Acetylsalicylic acid, but not clopidogrel, inhibits therapeutically induced cerebral arteriogenesis in the hypoperfused rat brain [J]. J Cereb Blood Flow Metab, 2012, 32(1): 105-114
- [18] Kivity S, Kopel E, Maor E, et al. Association of serum uric acid and cardiovascular disease in healthy adults [J]. Am J Cardiol, 2013, 111(8): 1146-1151
- [19] 杨怀芹, 李娜. 高同型半胱氨酸血症与脑卒中的关系及临床意义 (附 106 例临床观察) [J]. 中国全科医学, 2005, 8(3): 236-237
- Yang Huai-qin, Li Na. Relationship between hyperhomocysteinemia and cerebral stroke and its clinical significance (a report of clinical observation of 106 cases) [J]. Chinese General Practice, 2005, 8(3): 236-237
- [20] Semplicini A, Inverso G, Realdi A, et al. Blood pressure control has distinct effects on executive function, attention, memory and markers of cerebrovascular damage [J]. J Hum Hypertens, 2011, 25(2): 80-87
- [21] Borroni B, Premi E, Agosti C, et al. Revisiting brain reserve hypothesis in frontotemporal dementia: evidence from a brain perfusion study [J]. Dement Geriatr Cogn Disord, 2009, 28(2): 130-135