

的 观察慢性肾脏病 (CKD) 非透析患者血清非对称二甲基精氨酸 (ADMA) 水平与非勺型血压的相关性及其对心脏左心室结构和功能的影响。方法 横断面研究经肾活检证实的原发肾小球病非透析患者120例,分为CKD 1-2期、CKD3期和CKD 4-5期。液相色谱仪测血清ADMA浓度,24 h动态监测血压;收集临床资料和检验数据进行统计分析。结果 (1)随肾功能减退ADMA浓度进行性升高,从CKD 1-2期 (1.70 ± 0.48) $\mu\text{mol/L}$ 升至CKD 4-5期 (4.46 ± 1.56) $\mu\text{mol/L}$ ($P < 0.05$)。 (2)高血压组 (42例)ADMA浓度显著高于非高血压组 (78例) [3.53 ± 1.70] $\mu\text{mol/L}$ 比 [2.01 ± 0.65] $\mu\text{mol/L}$, $P < 0.05$]。 (3)非高血压组中非勺型血压50例,勺型28例;肾功能同等情况下,勺型血压患者ADMA浓度、左室质量指数 (LVMI) 均低于非勺型血压患者 (均 $P < 0.05$)。 (4)血清ADMA浓度与血尿酸(UA) ($r = 0.352$, $P < 0.01$)、LVMI ($r = 0.345$, $P < 0.05$)、24 h尿蛋白量 ($r = 0.200$, $P < 0.05$)、超敏C反应蛋白 (hs-CRP) ($r = 0.309$, $P < 0.01$) 呈正相关,与左室射血分数 ($r = -0.329$, $P < 0.01$)、估算肾小球滤过率 (eGFR) ($r = -0.011$, $P < 0.01$) 呈负相关。多元线性逐步回归示,eGFR、UA、LVMI、hs-CRP、24 h尿蛋白量是ADMA的相关因素,回归方程: $Y = 1.991 - 0.011 \times [\text{eGFR}] + 0.002 \times [\text{UA}] + 0.008 \times [\text{LVMI}] + 0.036 \times [\text{hs-CRP}] - 0.084 \times [24 \text{ h尿蛋白量}]$ 。结论 CKD患者早期血清ADMA水平即开始升高,随肾功能减退进行性升高,非勺型血压比率增大和左室受损加重;即使是CKD非高血压患者,其非勺型血压比率增大、ADMA浓度升高及LVMI增加。肾功能、尿蛋白、微炎症反应状态是ADMA的影响因素。

Objective To determine the correlation between serum asymmetric dimethylarginine (ADMA) and non-spoon-shaped blood pressure of non-dialysis chronic kidney disease (CKD) patients, also to observe the impact of the serum ADMA level on the structure and function of left ventricle. Methods One hundred and twenty cases of non-dialysis CKD patients underwent 24-hour ambulatory blood pressure monitoring were divided into three groups: CKD1-2, CKD3, CKD 4-5. Serum ADMA concentration was measured using liquid chromatograph and other clinical data such as uric acid (UA), left ventricular mass index (LVMI), 24 h urine protein, and high-sensitivity C-reactive protein (hs-CRP) were collected for further statistical analysis. Results (1) With the decline of renal function, ADMA concentration was increased, from CKD 1-2 (1.70 ± 0.48) $\mu\text{mol/L}$ rose to CKD 4-5 (4.46 ± 1.56) $\mu\text{mol/L}$ ($P < 0.05$). (2) There were 42 cases of CKD patients with hypertension and 78 cases of CKD patients with normal blood pressure. The serum ADMA levels in hypertension group was significantly higher than those in non-hypertensive group [3.53 ± 1.70] $\mu\text{mol/L}$ vs [2.01 ± 0.65] $\mu\text{mol/L}$, $P < 0.05$]. (3) There were 50 cases of non-spoon-shaped normotensive CKD patients and 28 cases of spoon-shaped normotensive CKD patients. Serum ADMA level and LVMI in non-spoon-shaped group were significantly higher than that in spoon-shaped group when kidney functions appeared to be equal ($P < 0.05$). (4) Serum ADMA level was positively correlated with UA ($r = 0.352$, $P < 0.01$), LVMI ($r = 0.345$, $P < 0.05$), 24 h urine protein ($r = 0.200$, $P < 0.05$), and high-sensitivity C-reactive protein ($r = 0.309$, $P < 0.01$), but negatively correlated with the left ventricular ejection fraction (LVEF) ($r = -0.329$, $P < 0.01$) and estimated glomerular filtration rate (eGFR) ($r = -0.011$, $P < 0.01$). Multiple regression results showed that eGFR, UA, LVMI, hs-CRP, 24 h urine protein were associated with ADMA level. The regression equation was $Y = 1.991 - 0.011 \times [\text{eGFR}] + 0.002 \times [\text{UA}] + 0.008 \times [\text{LVMI}] + 0.036 \times [\text{hs-CRP}] - 0.084 \times [24 \text{ h urinary protein}]$. Conclusions Serum ADMA level begins to increase in early stage CKD and it progressively increases with the decline of renal function, also the non-spoon-shaped blood pressure ratio and the left ventricular damage increase. Kidney function, urine protein and microinflammatory state may impact on the serum ADMA level.

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Correlation between serum asymmetric dimethylarginine and blood pressure variability in chronic kidney disease patients

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摘要

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