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Progress on the Relationship between Serum Cystatin C Level and Chronic Heart Failure after Coronary Heart Disease

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Abstract

Serum cystatin C (SCysC), also known as 2-trace alkaline protein or post-gamma globulin, is a low molecular weight non-glycosylated alkaline secreted protein, belonging to the family of cysteine protease inhibitors. In the pathological state, especially after chronic heart failure (CHF) after coronary heart disease, the expression level of SCysC will increase, suggesting that SCysC plays an important role in its physiological process. Recent studies have confirmed that CHD patients have high SCysC levels, and SCysC levels are closely related to the severity of CHF after CHD. The paper mainly reviews the molecular structure and the function and its relationship with CHF after coronary heart disease, to provide reference for clinical diagnosis and treatment of CHF.

Keywords

Chronic Heart Failure after Coronary Heart Disease, Serum Cystatin C, Review

血清胱抑素C与冠心病后慢性心衰关系的研究进展

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摘　要

血清胱抑素C (serum cystatin C, SCysC)又名γ^2痕迹碱性蛋白或后γ球蛋白，是一种低分子量的非糖基碱

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性分泌性蛋白，属半胱氨酸蛋白酶抑制剂家族。在病理状态下，尤其是在冠心病后慢性心衰(Chronic heart failure, CHF)后，SCysC表达水平会升高，提示SCysC在其病理生理过程中有重要作用。近年研究证实，冠心病后CHD患者SCysC水平高，且SCysC水平与冠心病后CHF的严重程度密切相关。本文主要对SCysC的分子结构与功能及其与冠心病后CHF的关系进行综述，为临床诊断和治疗CHF提供参考意义。

关键词

冠心病后慢性心衰，血清胱抑素C，综述

1. 引言

慢性心力衰竭(CHF)是大多数心血管疾病的最终归宿及最主要的死亡原因。近年来其发病率持续增长，有临床症状患者的 5 年存活率与恶性肿瘤相仿[1]。早期发现并处理 CHF 相当重要。《2018 年中国心力衰竭诊断和治疗指南》流行病学显示[2] CHF 病因以冠心病居首。各年龄段心衰病死率均高于同期其他心血管病。有研究表明[3]血清 CysC 可抑制内源性半胱氨酸蛋白酶活性，参与细胞外基质产生和降解间的动态平衡，降低心肌顺应性，参与心室重构，导致心功能恶化。国外研究显示[4] [5] [6] [7] [8]血清 CysC 可通过对血管内皮细胞功能、血管平滑肌细胞、凝血及脂质过氧化的影响对心肌及内膜产生毒性作用，并参与炎症反应，抑制酶及激素前体的活性，与左室肥厚及舒张功能有关。近年国外研究表明 SCysC 参与心室重构，而国内少见报道[9]。本文主要对 SCysC 的分子结构与功能及其与冠心病后 CHF 的关系进行综述，为临床诊治 CHF 及其预后提供参考。

2. SCysC 的分子结构与功能

SCysC 由 122 个氨基酸组成，相对分子量为 13 KD，在机体内广泛分布，生理作用为使细胞膜免受内源性或者外源性的蛋白酶水解，在动脉壁溶解平衡与抗蛋白溶解活性平衡中发挥重要作用[10] [11]。许多研究证实 SCysC 为评价肾功能的理想内源性标志物，与肌酐相比更敏感准确[12] [13]。近年研究发现，肾功正常的患者研究也存在 SCysC 水平升高[14]。国外相关研究表明其参与许多心管系统疾病的病理生理过程[15]。

3. SCysC 与冠心病后慢性心衰的关系

冠心病后 CHF 的实质是心肌细胞损伤、心肌细胞凋亡及细胞外基质的改变致使心室重构，最后导致 CHF [16]。以往人们关注的焦点总是心肌细胞的改变，现人们逐渐认识到了心肌细胞外基质改变在 CHF 发生发展中的作用。细胞外基质重构的发生是心肌胶原合成与降解失衡的结果[17] [18]。有研究表明[15] SCys-C 可抑制内源性半胱氨酸蛋白酶活性，参与细胞外基质产生和降解间的动态平衡，降低心肌顺应性，参与心室重构，导致心功能恶化。国外研究显示[4] [5] [6] [7] [8] SCys-C 可通过对血管内皮细胞功能、血管平滑肌细胞、凝血及脂质过氧化的影响对心肌及内膜产生毒性作用，并参与炎症反应，抑制酶及激素前体的活性，与左室肥厚及舒张功能有关。相关研究表明 SCysC 水平与冠心病后心衰患者心功能 NYHA 分级呈正相关[19]。此外，有学者研究表明高水平 SCysC 可增加冠心病的全因死亡率、心血管事件及心

衰的发生率[20]。SCysC 可作为冠心病后慢性心衰的患者近期心血管事件及死亡的独立预测因子与近期的预后有密切的关系[21]。

4. 小结与展望

冠心病后慢性心力衰竭是心血管疾病的终末期表现及最主要的死因。近年来，CHF 患病率逐年升高，严重威胁患者的生活质量及健康寿命，SCysC 可作为临床诊断及判断冠心病后 CHF 严重程度的实验室指标[20]。早期根据 SCysC 水平早期进行危险分层，尽早给予合理的治疗措施可改善预后。但 SCysC 与冠心病后 CHF 相关性的更确切机制尚待进一步深入研究。

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