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急性心肌梗死合并心源性休克相关预后模型研究进展

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摘 要

急性心肌梗死(Acute Myocardial Infarction, AMI)是由于冠状动脉粥样硬化、血栓形成、冠状动脉痉挛等原因导致的局部心肌细胞坏死和心脏收缩功能下降的疾病，是心血管疾病中的一种常见严重疾病。尽管近年来，随着早期血运重建的使用，AMI的治疗已经取得较大进展，但其死亡率仍较高不下，其中，AMI并发心源性休克(Cardiogenic Shock, CS)是导致患者死亡的一个主要原因。因此，早期对AMI合并CS患者进行准确的危险程度评估及风险分层显得尤为关键。目前，已有多种评分系统用于预测AMI合并CS患者的预后，本文旨在综述与AMI合并CS相关的预后模型，以期为临床决策提供更为科学的依据。

关键词

急性心肌梗死，心源性休克，预后模型

Progress in Prognostic Model Research for Acute Myocardial Infarction Complicated by Cardiogenic Shock

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Abstract

Acute Myocardial Infarction (AMI) is a disease characterized by localized necrosis of cardiac myo-

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cytes and a decrease in cardiac contractile function due to atherosclerosis of the coronary arteries, thrombosis formation, coronary artery spasm, and other causes. It represents a common and serious condition within the spectrum of cardiovascular diseases. Despite significant advancements in the treatment of AMI in recent years, especially with the advent of early revascularization, mortality rates remain high. A major contributor to patient mortality is the development of cardiogenic shock (CS) as a complication of AMI. Therefore, early and accurate risk assessment and stratification of patients with AMI complicated by CS is crucial. Currently, several scoring systems are available to predict the prognosis of patients with AMI complicated by CS. This article aims to review prognostic models related to AMI with concurrent CS, in order to provide a more scientific basis for clinical decision-making.

Keywords

Acute Myocardial Infarction, Cardiogenic Shock, Prognostic Models

1. 前言

急性心肌梗死(Acute Myocardial Infarction, AMI)是由于冠状动脉粥样硬化、血栓形成、冠状动脉痉挛等原因导致的局部心肌细胞坏死和心脏收缩功能下降的疾病，是心血管疾病中的一种常见严重疾病[1]。尽管近年来，随着早期血运重建的使用，AMI 的治疗已经取得较大进展，但其死亡率仍较高不下，其中 AMI 并发心源性休克(Cardiogenic Shock, CS)是导致患者死亡的一个主要原因，据统计，约有 5%~15%的 AMI 患者会出现 CS [2]，占全部 CS 死亡患者的 80%左右[3]。随着医疗水平的提高，先进的生命支持(如机械通气和机械循环辅助设备)使 CS 患者的死亡率有所下降，但 CS 仍然是世界范围内导致患者死亡主要原因[2] [4]，在过去二十年中，其死亡率保持在 40%~70% [5] [6]。除了高死亡率外，CS 患者的重症监护病房(Intensive Care Unit, ICU)住院花费也在增加，ICU 患者的花费比非 ICU 患者高 2.5 倍[7]，医疗成本的增加给有限的医疗资源带来了挑战。

在临床实践中，AMI 合并 CS 患者的病情严重程度及临床结局存在显著差异，其死亡率的异质性主要由患者的临床特征所决定[8]。因此，早期对患者进行准确的危险程度评估及风险分层显得尤为关键[9]。通过精准的风险评估，能够及时识别出高风险患者，这对于指导临床决策、提升患者生存率具有至关重要的作用[10]。鉴于此，开发并验证高效的评分系统以预测心源性休克患者的预后，对于指导临床治疗决策及改善患者预后有着重要的意义。

目前，已有多种评分系统用于预测 AMI 合并 CS 患者的预后，包括但不限于急性生理与慢性健康评估评分(Acute Physiology and Chronic Health Evaluation, APACHE) [11]、序贯器官衰竭评分(Sequential Organ Failure Assessment, SOFA)评分系统[12]、心血管血管造影和介入学会(Society for Cardiovascular Angiography and Interventions, SCAI)休克分级[13]、第二代简化急性生理评分(Simplified Acute Physiological Score, SAPS II) [14]、IABP SHOCK II 评分[15]和 CardShock 风险评分[3]等。这些评分系统在众多研究中被应用于评估 AMI 合并 CS 或冠状动脉介入治疗患者的预后，并已证实取得了良好的效果。本文旨在综述与 AMI 合并 CS 相关的预后模型，以期为临床决策提供更为科学的依据。

2. AMI 合并 CS 患者相关预后模型

2.1. APACHE 评分模型

APACHE 评分系统是在 1981 年由 Knaus 等人建立的，旨在评估危重症患者病情严重程度，该评分系统自 1981 年首次提出以来，经历了多次更新和改进，从最初的 APACHE I 到最新的 APACHE IV。APACHE II 评分是原始 APACHE 评分的改进版[16]，它包括急性生理参数和慢性健康状况，其综合考虑了 12 项生理指标、年龄及既往疾病史情况，评分范围从 0~71 分不等，分数越高，表示患者病情越严重，院内死亡风险越大。它被广泛认为是判断 ICU 患者病情严重程度和预后的重要标准之一[17] [18]。APACHE III 提供了更精细的风险评估模型，其包括更多的生理参数和对慢性健康状况的更详细评估[19]。APACHE III 评分系统还提供了一个数据库，用于与患者的实际结果进行比较，以提高预测的准确性[20]。APACHE IV 于 2006 年推出，是最新的版本[21]，其包括对一些新变量的评估，旨在提高对特定患者群体死亡风险预测的准确性。APACHE II 评分是目前全球最广泛使用且最具权威的危重症患者评分方法，研究表明，APACHE II 评分相比于其他指标更能预测危重患者预后[17] [22] [23]，它不仅能够评估患者群体的整体预后，也能够对个体患者的死亡率进行预测，具有重要的临床价值和科学意义[17] [24]。

2.2. SOFA 评分系统

SOFA 评分系统旨在以客观和定量的方式，追踪并描述 ICU 中脓毒症患者器官功能障碍的演变情况及其严重度，并对患者的预后进行评估[25] [26]。该评分覆盖了呼吸功能、凝血功能、肝脏功能、心脏功能、中枢神经系统和肾脏功能六个方面，每个方面都有 0 到 4 分的评分范围，总分越高，表明器官衰竭的程度越重，预后可能越差[27]，例如，当患者的 SOFA 评分在 7 至 9 分之间时，其院内死亡率大约在 15%至 20%之间。尽管 SOFA 评分在临床预后评估中具有重要价值，但其应用的复杂性限制了其在临床场景中的使用[28]。针对这一局限性，SOFA 评分衍生出来了更加便捷的快速 SOFA 评分(Quick Sequential Organ Failure Assessment, qSOFA)，旨在提供一种更为便捷的评估工具[29]。qSOFA 通过评估三个容易观察到的临床指标——意识状态改变、呼吸频率 ≥22 次/分钟、收缩压 ≤100 mmHg，简化了评分过程。与原始的 SOFA 评分相比，qSOFA 更加简便实用，适用于快速评估患者的病情严重程度和预后风险[30]。

2.3. SCAI 休克分级

为了可以简单的评估 CS 患者病情状态，并允许临床试验适当地区分患者，2019 年，SCAI 的一个多学科委员会，制定了一种无需计算的简单工具，描述了从 A 到 E 的休克阶段[31]。A 期是心源性休克的“风险期”，B 期是“开始”休克，C 期是“经典”心源性休克，D 期是“恶化期”，E 期是“终末期”。SCAI 休克分级标准包括体格检查、实验室检验结果和血流动力学指标，由于期简单易行，并可用于各种临床环境，所以自 2019 年以来，SCAI SHOCK 分期分类已被广泛采用，并在多个临床试验中被验证[32] [33] [34]。

2.4. SAPS II 评分

SAPS II 由 Le Gall 等在 1993 年通过分析 152 例重症监护病房(Intensive Care Unit, ICU)患者的入院数据而构建，是目前临床上较常用的疾病严重程度评分系统之一。在一项多中心的大型临床研究中，SAPS II 评分准确性较好[35]，但是由于其计算的复杂性，限制了该评分的正确应用及临床推广程度。

2.5. IABP SHOCK II 评分

该评分系统是基于 IABP SHOCK II 试验的一个亚研究推导出来的[36]，该评分共包括年龄、卒中史、

入院时血糖、血肌酐、动脉血乳酸水平和 PCI 后冠状动脉血流量等 6 个不同的变量，每个变量根据危险程度被赋予 1~2 分，总分共 9 分，根据总分的不同的分值，将 AMI 合并 CS 患者分成了三组：0~2 分低风险组(死亡率为 29%)，3~4 分中风险组(死亡率为 68%)，5~9 分高风险组(死亡率为 80%) [15]。但是该评分系统只在欧洲 CardShock 试验的患者群体中进行了外部验证，并不能很好的说明其在更广泛应用中的有效性和可靠性。所以该评分模型还需要更多的临床研究去验证其预测价值。

2.6. CardShock 风险评分

CardShock 风险评分是基于是一项欧洲视角、观察性、多中心和跨国研究推导出来的，其包括七个项目：年龄、既往心肌梗死或搭桥手术后、急性冠脉综合征、左心室射血分数 ＜40%、动脉血乳酸、肾小球滤过率等七个变量，总分为 9 分，其中 0~3 为低风险，4~5 为中等风险，6~9 为高风险[37]。在 Rivas-Lasarte 等人的验证研究中，证实 CardShock 评分对 AMI 合并 CS 患者的院内死亡风险具有良好的预测作用[38]。

3. 结论与展望

由于人口老龄化，引起 AMI 合并 CS 的发病率在过去十年中显着增加，从 2003 年的 6.5%增加到 2010 年的 10.1% [39]。随着血运重建和机械循环等支持性治疗的重大进展，AMI 合并 CS 患者是死亡率稍有下降，但仍在 40%以上[40]。这种高死亡率不仅反映了心源性休克的严重程度，也突显了对 AMI 合并 CS 患者进行早期危险分层的重要性[41]。然而由于 AMI 合并 CS 患者病情的复杂性，AMI 合并 CS 患者的管理仍然充满挑战[42]。风险评分有助于对疾病的严重程度进行分类，并识别有较高不良后果风险的患者[43]。它们不仅可以帮助临床医生早期识别高危患者，还可以向患者、家属和其他团队成员传达不良后果的风险，并有潜力被用于评估患者死亡或临床恶化的风险[44]。此外，准确的风险分层可以促进共同决策，帮助临床医生选择合适的管理策略[45] [46]。有效的预测评分可以帮助医生评估 AMI 合并 CS 患者的死亡风险，从而指导治疗决策，优化资源分配，并最终改善患者的临床结果[3] [47]。与传统的重症评分、心血管系统特异性评分相比，IABP SHOCK II 评分和 CardShock 风险评分更受研究人员的青睐。然而，目前国外甚至涉及 CardShock 风险评分和 IABP SHOCK II 评分的外部验证研究很少，其中大部分是回顾性研究，其结果需要通过大量的多中心和前瞻性研究进一步验证。此外，随着肌钙蛋白、BNP、白蛋白、肌酐等分子组学的发展，以及 CS 诊断率的提高，迫切需要一种更符合临床和研究需求的 CS 预后模型。

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