

# Selvester QRS 评分系统研究进展

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**【摘要】**急性心肌梗死面积大小对生存率和死亡率有重要预测价值,左室射血分数是急性心肌梗死后一个重要的预后指标,与梗死程度有关。Selvester QRS 评分系统可用于评估左心室心肌梗死面积的大小和位置,与心室壁运动异常的严重程度和左室射血分数密切相关,Selvester QRS 评分系统可用于心脏猝死风险分层,也可预测左室功能障碍患者室性心律失常。在左束支传导阻滞、非缺血性心肌病、植入型心律转复除颤器植入患者中也有重要的评估价值。

**【关键词】**急性心肌梗死;左室射血分数;Selvester QRS 评分

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## Selvester QRS Scoring System

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**【Abstract】**The size of acute myocardial infarction has important predictive value for survival and mortality. Left ventricular ejection fraction is an important prognostic indicator after acute myocardial infarction, which is related to the degree of infarction. The Selvester QRS scoring system can be used to assess the size and location of left ventricular myocardial infarct size, closely related to the severity of ventricular wall motion abnormalities and left ventricular ejection fraction. The Selvester QRS scoring system can be used to stratify sudden cardiac death risk or predict left ventricular arrhythmias in patients with ventricular dysfunction. There are also important evaluation values in patients with left bundle branch block, non-ischemic cardiomyopathy and implant cardioverter defibrillator.

**【Key words】**Acute myocardial infarction; Left ventricular ejection fraction; Selvester QRS score

心血管疾病是全球的首要致死原因,疾病负担逐年加重。据世界卫生组织统计,在 2012 年有 1 750 万人死于心血管疾病,占全球死亡总数的 31%,这些死者中,估计 740 万人死于冠状动脉粥样硬化性心脏病,670 万人死于卒中。在中国,心血管疾病占有死因的 0.40%。总体上看,中国心血管病患病率及死亡率仍处于上升阶段<sup>[1]</sup>。随着中国经济的增长,居民生活方式的改变,冠状动脉粥样硬化性心脏病的发病率和死亡率在未来 10 年仍将呈上升趋势<sup>[2]</sup>。急性 ST 段抬高型心肌梗死 (ST-segment elevation myocardial infarction, STEMI) 作为冠状动脉粥样硬化性心脏病的危急重症,其发病率和死亡率一直是关注的重点。从 2001 年至今,STEMI 患者住院率逐年升高。对于 STEMI 患者,急诊血运重建 (包括经皮冠脉介入术或冠状动脉旁路移植术) 可以明显降低死亡率,改善远期预后<sup>[3]</sup>。对冠状动脉病变严重性、左心室功能、心肌缺血、心肌存活性和心律失常的评估,对 STEMI 患者危险分层、预后具有重要意义。Selvester QRS 评分系统将心脏电活动的细微变化转化为有关心肌梗痕

位置和大小信息,可用于评估 STEMI 患者心肌梗死面积和左心室功能,在早期危险分层中起重要作用<sup>[4]</sup>。该评分系统对非缺血性心肌病、心律失常、植入型心律转复除颤器 (implant cardioverter defibrillator, ICD) 植入评价也具有一定意义。

### 1 Selvester QRS 评分系统用于评价急性心肌梗死患者心肌梗死面积

晚期钆增强磁共振成像是目前评价心肌梗死面积的标准方法,可以确定心肌梗死面积和生存能力<sup>[5]</sup>。但心脏磁共振价格昂贵,操作相对复杂,临床应用有一定局限性。Wagner 等<sup>[6]</sup>开发了一种 Selvester QRS 评分系统,该系统通过观察标准 12 导联心电图的 Q 波和 R 波持续时间以及 R/Q 和 R/S 振幅比值来估计梗死面积,并且通过评价发现,评分与梗死面积之间有良好的敏感性和相关性。该评分系统是基于 12 导联常规心电图分析,采用 54 条标准 32 分,来评估心肌梗死面积,总分乘以 3% 即为心肌梗死面积大小。相关研究认为, Selvester QRS 评分越高,心肌梗死面积越大,接受经皮冠脉介入术治疗的 STEMI

患者的长期死亡率越高<sup>[4]</sup>。经过尸检证明, Selvester QRS 评分可以较好地反映急性心肌梗死 (acute myocardial infarction, AMI) 患者左心室前 1/3 的梗死面积大小。Anderson 等<sup>[7]</sup>研究了 82 例急性下壁心肌梗死发作后 3 天 QRS 波群变化的演变, Selvester QRS 评分呈连续性增加, Pahlm 等<sup>[8]</sup>研究也发现, 使用 Selvester QRS 评分对下壁梗死具有 95% 的特异性和高敏感性。对于前壁心肌梗死, 采用心脏磁共振成像对比, Selvester QRS 评分能较好地反映前壁心肌梗死患者的总灌注不足<sup>[9-10]</sup>。另有研究<sup>[11]</sup>发现, 在接受再灌注治疗的 STEMI 患者, 心脏磁共振成像与 Selvester QRS 评分测量的梗死大小之间存在相关关系, 急性前壁心肌梗死患者 Selvester QRS 评分与微血管阻塞存在一定关系。以心脏磁共振为参考标准, Selvester QRS 评分系统检测和量化孤立侧壁心肌梗死, 同样具有较高的敏感性<sup>[12]</sup>。对于 STEMI 患者在接受经介入治疗后, 出院时进行心肌梗死面积的评分, 是一个独立且预后相关的指标, 可以较好地指导临床。

## 2 Selvester QRS 评分系统用于评价左室射血分数

左室射血分数 (left ventricular ejection fraction, LVEF) 是判断心脏收缩功能、心力衰竭类型的重要指标之一, 对心肌功能的评估, 在心内科患者的评估和管理中具有重要作用, 可提供重要的预后信息和指导治疗决策<sup>[13]</sup>。临床上可通过超声心动图、心脏磁共振成像进行检查。人们都知道, LVEF 是 AMI 后的一个重要的预后指标, 与梗死程度有关。AMI 后, 心电图可提供重要的左室功能间接定量信息。Palmeri 等<sup>[14]</sup>对 55 例未发生左室肥厚或传导异常的心肌梗死患者采用 Selvester QRS 评分系统, 该评分与核素测定的 LVEF 成反比, 推导出公式:  $LVEF(\%) = 60 - (3 \times QRS \text{ score})$ 。Roubin 等<sup>[15]</sup>对 181 例心肌梗死患者进行常规心电图 Selvester QRS 评分与左心室功能的关系研究, 研究发现 Selvester QRS 评分与室壁运动异常严重程度及 LVEF 密切相关, 并推导出公式:  $LVEF(\%) = 66 - (3.3 \times QRS \text{ score})$ 。Seino 等<sup>[16]</sup>对 AMI 发病 3~7 d 后的心电图 Selvester QRS 评分, 发现与早期 LVEF 显著相关, 推导出公式:  $LVEF(\%) = -2.16 QRS \text{ score} + 59.58$ 。Weir 等<sup>[17]</sup>研究了 34 例 STEMI 患者, 将心脏磁共振成像与 Selvester QRS 评分进行对比, 推导出公式:  $LVEF(\%) = 61 - (1.7 \times QRS \text{ score})$ 。以上研究结果对于 LVEF 的评估方式虽不一致, 结果存在一定差异, 但在某些程度上都能反映该评分系统评价左心功能的作用。也有研究<sup>[18]</sup>表明, 该评分系统与左心室功能的相关性较弱。对左心功能的最新研究<sup>[10]</sup>表明, Selvester QRS 评分与左室收缩期末期容积及射血分数密切相关。总之, 该评分系统在评价心脏收缩功能的价值上需要进一步研究及新的更有利的证据支持。

## 3 Selvester QRS 评分系统应用拓展

Selvester QRS 评分可用来评估心肌梗死面积大小

和左心室舒张功能, 可用于心脏猝死风险分层和预测左室功能障碍患者室性心律失常。随着评分系统的深入研究和开发, 其在临床的应用越来越广泛。有研究表明, 该系统在肥厚型心肌病患者心肌纤维化评价及左心室结构与功能的评价方面具有一定价值。Bignoto 等<sup>[19]</sup>研究认为, Selvester QRS 评分提供了可靠的肥厚型心肌病患者心肌纤维化的定量。Hiraiwa 等<sup>[20]</sup>对 91 例非缺血性扩张型心肌病患者进行平均 4.5 年随访, 结果显示 Selvester QRS 评分可以预测未来非缺血性扩张型心肌病的心脏事件。Sobue 等<sup>[21]</sup>采用心脏磁共振和 Selvester QRS 评分, 对 59 例结节病性心肌病 (cardiac sarcoidosis, CS) 患者心肌瘢痕进行评估, 结果表明, Selvester QRS 评分可用来评估 CS 相关心肌损伤, 并与心脏磁共振一样能较好地识别 CS 患者。较高的 Selvester QRS 评分也与 CS 中危及生命事件的风险增加有关。另有研究<sup>[22-23]</sup>表明, 该评分系统可能对心脏再同步化治疗合并左束支传导阻滞 (left bundle branch block, LBBB) 患者生存率预测有价值, 对 LBBB 患者的高瘢痕负荷均可预测其不良总体预后。AMI 后形成的心肌瘢痕, 是器质性心脏病患者室性心律失常发生的重要基础, 对于心肌梗死面积的评价, 有利于确定何种患者可从 ICD 植入中获益<sup>[24]</sup>。Strauss 等<sup>[25]</sup>证实, 对于 ICD 休克风险较低的患者, Selvester QRS 评分提示无瘢痕患者发生室性心动过速、心室颤动事件明显减少。Poels 等<sup>[26]</sup>对 36 例经导管主动脉瓣置入术合并 LBBB 患者, 进行 Selvester QRS 评分, 结果提示, 该评分标准高估了瘢痕大小, 建议谨慎使用, 但评分仍然可以提供有用的信息。Chaudhry 等<sup>[27]</sup>研究了该评分与晚期钆增强磁共振成像之间的关系, 评估了潜在心力衰竭、LBBB 和 ICD 治疗患者的瘢痕负担和临床结果。结果表明, 晚期钆增强磁共振成像与 Selvester QRS 评分证实的心肌瘢痕有一定的相关性。基于心脏磁共振的瘢痕负担与临床结果相关, 但与该评分不相关。Selvester QRS 评分算法还需要进一步完善, 以便在临床上对 LBBB 患者进行详细的瘢痕评估时具有相关性和可靠性。最近一项对 2 742 例可疑心肌缺血、1 151 例疑似急性心力衰竭的患者进行的前瞻性研究表明, Selvester QRS 评分可用于心肌瘢痕的简单、无创、廉价的检测和定量, 并可用于死亡率的预测<sup>[28]</sup>。一项关于该评分系统的指南<sup>[29]</sup>详细描述了在心电图混杂因素存在情况下, 使用 Selvester QRS 评分定量心肌瘢痕。为了便于计算, Xia 等<sup>[30]</sup>开发了一种自动 Selvester QRS 评分系统, 可用于评估 LBBB 患者。

## 4 小结

心电图是临床上的常规检查, 便于临床医生收集和连续记录。Selvester QRS 评分系统是一种基于标准 12 导联心电图定量标准的评分系统, 它联系了各项心

电参数和心脏结构之间的关系,可用于 AMI 患者心肌梗死面积、左心室功能评估。在临床预后评价中具有一定价值,是一种经济、有效的方法。目前 Selvester QRS 评分系统在不断完善,适应证不断扩大。

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