

doi: 10.13241/j.cnki.pmb.2018.06.015

除颤时间与心脏性猝死除颤复苏成功率的相关性分析*

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摘要 目的:研究除颤时间与心脏性猝死患者除颤复苏成功率的相关性。**方法:**选取 2015 年 2 月至 2017 年 6 月于我院接受除颤复苏治疗的心脏性猝死患者 120 例为研究对象。分析除颤时间与除颤复苏成功以及心功能舒张早期充盈峰速度(E 峰)、左室射血分数(LVEF)、左心室舒张末期内径(LVEDD)以及 E/舒张晚期充盈峰速度(A)水平的相关性。**结果:**电除颤时间<2 min 患者的复苏成功率为 60.00%(21/35), 显著高于电除颤时间 2~5 min、5~10 min 以及 >10 min 患者的 34.21%(13/38)、11.11%(3/27)、0.00%(0/20), 而电除颤时间 2~5 min 患者的复苏成功率又显著高于电除颤时间 5~10 min 患者, 差异均有统计学意义(均 $P<0.05$)。电除颤时间<2 min、2~5 min、5~10 min 以及 >10 min 患者的 E 峰、LVEF、LVEDD 以及 E/A 水平呈逐渐下降趋势, 差异均有统计学意义(均 $P<0.05$)。Pearson 相关性分析结果显示心脏性猝死患者除颤时间与除颤复苏成功率、E 峰、LVEF、LVEDD 以及 E/A 均呈负相关关系($r=-0.593, P=0.000; r=-0.476, P=0.001; r=-0.523, P=0.000; r=-0.502, P=0.000; r=-0.469, P=0.001$)。**结论:**除颤时间与心脏性猝死患者除颤复苏成功率呈负相关关系, 即除颤时间越早, 患者复苏成功率越高。

关键词:心脏性猝死; 抢救; 除颤时间; 复苏成功率; 相关性

中图分类号: R541.78 文献标识码: A 文章编号: 1673-6273(2018)06-1077-04

Correlative Analysis of the Defibrillation Time with Success Rate of Defibrillation Recovery in Patients with Cardiac Sudden Death*

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ABSTRACT Objective: To study the correlation of defibrillation time with the success rate of defibrillation in patients with cardiac sudden death. **Methods:** 120 cases of patients with cardiac sudden death were selected from February 2015 to June 2017 in our hospital. The correlation of defibrillation time and cardiac function peak early diastolic filling velocity (peak E), left ventricular ejection fraction (LVEF), left ventricular end-diastolic diameter (LVEDD), and E/peak late diastolic filling velocity (A) level were analyzed. **Results:** The success rate of recovery of patients with defibrillation time < 2 min was 60.00% (21/35), which was significantly higher than that of patients with defibrillation time 2~5 min, 5~10 min, and > 10 min [34.21% (13/38), 11.11% (3/27), 0.00% (0/20)], and the success rate of recovery of patients with defibrillation time 2~5 min was significantly higher than those of patients with defibrillation time 5~10 min (all $P<0.05$). The level of E peak, LVEF, LVEDD and E/A of patients with electrode fibrillation time <2 min, 2~5 min, 5~10 min and >10min were gradually decreased with significant differences (all $P<0.05$). According to Pearson correlative analysis, the success rate of sudden cardiac death in patients with sudden cardiac death was negatively correlated with the recovery success rate, E peak, LVEF, LVEDD and E/A ($r = -0.593, P = 0.000; r = -0.476, P = 0.001; r = -0.523, P = 0.000; r = -0.502, P = 0.000; r = -0.469, P = 0.001$). **Conclusions:** The survival rate of patients with cardiac sudden death was negatively correlated with the success rate of defibrillation recovery.

Key words: Sudden cardiac death; Rescue; Defibrillation time; Success rate of recovery; Correlation

Chinese Library Classification(CLC): R541.78 **Document code:** A

Article ID: 1673-6273(2018)06-1077-04

前言

心血管疾病是导致患者猝死的主要因素之一, 临床上对于该类由心血管疾病突然导致的猝死称之为心脏性猝死^[1], 属于临床危急重症患者以及各种疾病终末期较为常见的严重临床过程, 心脏停跳、意识障碍等均是心脏性猝死患者最为常见的

临床症状表现^[2,3]。患者既往有心脏疾病史均可发病, 且发病前期通常无任何症状以及体征, 发病时患者意识会突然丧失, 通常在 1h 内死亡^[4,5]。有研究显示心脏性猝死发生后由于脑血流的突然中断, 患者通常在 10s 内即会出现意识丧失, 最佳的抢救时间<4 min, 且抢救时间越早, 效果越佳^[6,7]。目前, 除颤治疗被广泛应用于心脏骤停患者中, 具有明显的效果。其主要是

* 基金项目: 国家自然科学基金项目(81571736)

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(收稿日期: 2017-10-18 接受日期: 2017-11-15)

通过给予患者心脏外源性的高能量脉冲电流,促使心肌细胞在瞬间发生除极反应,使得心脏电活动暂停,随后由自律性最高的起搏点再次发动冲动,进一步主导心脏节律,达到心肺复苏的目的^[8,9]。本研究通过分析心脏性猝死抢救中患者除颤时间与除颤复苏成功率的相关性,旨在为临床除颤治疗心脏性猝死提供参考依据,现作如下报道。

1 材料与方法

1.1 资料来源

选取 2015 年 2 月至 2017 年 6 月于我院接受除颤复苏治疗的心脏性猝死患者 120 例为研究对象。纳入标准^[10]:(1)所有患者均由心脏原因导致的自然死亡;(2)在急性症状体征发生后 1h 内死亡;(3)均接受除颤资料。排除标准:(1)因其他原因导致的死亡患者;(2)伴有恶性肿瘤或尿毒症等终末期疾病者;(3)年龄<18 周岁。其中男性患者 67 例,女性患者 53 例,年龄 22~84 岁,平均年龄(64.5±10.4)岁;既往病史:冠心病史 38 例,高血压病 17 例,脑梗死病史 8 例,糖尿病史 17 例,冠心病合并糖尿病 10 例,高血压合并糖尿病 7 例,冠心病合并高血压 6 例。所有患者家属均签署知情同意书,且经我院伦理委员会已批准。

1.2 研究方法

(1) 电除颤抢救方式如下:采用 GE Marquette Hellige 牌 GmbH D-79111 型除颤机(购自德国)进行除颤,连接电源、地线以及患者肢体导联线,启动开关,选择体外除颤与非同步模式后进行充电。第 1 次选择电流频率为 200 J,随后逐步增加至 300J~360J,除颤次数在 1~13 次范围内。选用盐水纱布均匀涂于患者左锁骨中线和第 4 肋间交界部位以及右第 2 肋间胸骨旁,完成充电后保证电极板和患者皮肤紧密接触,待其余人员离开床位后开始放电,密切观察心电图情况。(2)各项心功能

指标水平检测:待除颤成功后,所有患者均取平卧位,予以心脏彩色多普勒超声检查。其中超声探头为 315 MHz,心尖四腔切面,分别测定舒张早期充盈峰速度(E 峰)、左室射血分数(LVEF)、左心室舒张末期内径(LVEDD)以及 E/舒张晚期充盈峰速度(A)水平。上述每个数据均重复测量 3 个周期,取平均值作为最后检查结果。

1.3 观察指标

除颤复苏成功率判定标准如下^[11]:(1)患者瞳孔从大缓缓变小;(2)苍白脸色逐渐转为红润;(3)眼球开始活动,且出现睫毛反射与对光反射;(4)颈动脉搏动在停止心外按压后仍跳动;(5)血压值>60/40 mmHg;(6)自主呼吸恢复。除颤复苏失败判定标准如下:经 30 min 连续除颤复苏,患者依旧无法恢复心跳与呼吸。

1.4 统计学方法

采用 SPSS20.0 软件进行统计学分析,计数资料以[n(%)]表示,采用 χ^2 检验,计量资料以($\bar{x} \pm s$)表示,多组间比较采用方差分析,指标的相关性采用 Pearson 相关分析进行评价, $P < 0.05$ 为差异有统计学意义。

2 结果

2.1 不同电除颤时间患者的复苏成功率比较

不同电除颤时间患者的复苏成功率比较差异有统计学意义($P < 0.05$)。电除颤时间<2 min 患者的复苏成功率为 60.00%(21/35),显著高于电除颤时间 2~5 min、5~10 min 以及>10 min 患者的 34.21%(13/38)、11.11%(3/27)、0.00%(0/20),而电除颤时间 2~5 min 患者的复苏成功率又显著高于电除颤时间 5~10 min 患者,差异均有统计学意义(均 $P < 0.05$)。见表 1。

表 1 不同电除颤时间患者的复苏成功率比较(例,%)

Table 1 Comparison of the success resuscitation rates of patients with different defibrillation time

Goups	Amount	Resuscitation successful(rate)	P
<2min	35	21(60.00%)	0.000
2~5min	38	13(34.21%)*	
5~10min	27	3(11.11%)*#	
>10min	20	0(0.00%)*#	
Total	120	37(30.83%)	

Note: Compared with defibrillation time<2 min group, * $P < 0.05$; Compared with defibrillation time 2~5 min group, # $P < 0.05$.

2.2 不同电除颤时间患者的心功能指标水平对比

电除颤时间<2 min、2~5 min、5~10 min 以及>10 min 患者的 E 峰、LVEF、LVEDD 以及 E/A 水平呈逐渐下降趋势,差异均有统计学意义(均 $P < 0.05$)。见表 2。

2.3 心脏性猝死患者除颤时间与除颤复苏成功率以及各项心功能指标的相关性

Pearson 相关性分析显示:心脏性猝死患者除颤时间与除颤复苏成功率、E 峰、LVEF、LVEDD 以及 E/A 均呈负相关关系(均 $P < 0.05$)。见下表 3。

3 讨论

心脏性猝死主要是指因心脏原因导致的突然死亡,患者既往有心脏病史均可发病,且发病前期通常无任何症状以及体征^[12,13],属于心血管疾病患者中最危急的征象。其中,约 25%~28%的患者为急性心肌梗死性猝死,且绝大部分均发生在院外,由于距离、交通等因素影响,无法在 4 min 内得到医治,抢救成功率较低。如不能给予及时有效的治疗,会对患者的生命健康安全造成严重影响^[14-16]。既往临床上主要采用徒手心肺复苏术进行复苏治疗,但该治疗方式操作者会因疲劳达至操作准确性下降,从而影响抢救效果^[17-19]。特别是在患者被运送至医院过程中,徒手心肺复苏术无法保证救治的有效性,同时还受多

表 2 不同电除颤时间患者的心功能指标水平对比(例, $\bar{x} \pm s$)

Table 2 Comparison of the cardiac function indexes of patients with different defibrillation time

Goups	Amount	E Peek(cm/s)	LVEF(%)	LVEDD(mm)	E/A
<2min	35	75.21± 8.41	67.41± 7.27	56.71± 6.01	1.41± 0.17
2~5min	38	72.38± 7.61	64.89± 7.05	53.45± 5.48	1.39± 0.15
5~10min	27	67.05± 7.17	62.47± 6.87	50.29± 5.08	1.30± 0.13
>10min	20	61.24± 6.51	57.19± 6.25	44.62± 4.85	1.27± 0.11
P	-	0.000	0.000	0.000	0.000

表 3 心脏性猝死患者除颤时间与除颤复苏成功率以及各项心功能指标的相关性

Table 3 Correlation of the defibrillation time with the success rate of defibrillation and cardiac function index of patients with sudden cardiac death

Related factors	Defibrillation time	
	r	P
Resuscitation successful rate	-0.593	0.000
E Peek	-0.476	0.001
LVEF	-0.523	0.000
LVEDD	-0.502	0.000
E/A	-0.469	0.001

种因素的影响。从而导致其复苏抢救成功率并不十分理想^[20-22]。随着近年来医疗水平的不断进步以及医疗器械的逐渐完善,电除颤治疗开始被广泛应用于心脏骤停患者的复苏治疗中,且效果较为明显,但其应用于心脏性猝死患者中的相关研究报道并不多见^[23-25]。鉴于此,本研究主要探讨了除颤时间与心脏性猝死患者除颤复苏成功率的相关性,旨在为提高心脏性猝死患者除颤复苏成功率提供指导。

本研究结果显示电除颤时间<2 min 患者的复苏成功率为 60.00%(21/35),显著高于电除颤时间 2~5 min、5~10 min 以及>10 min 患者的 34.21%(13/38)、11.11%(3/27)、0.00%(0/20),而电除颤时间 2~5 min 患者的复苏成功率又显著高于电除颤时间 5~10 min 患者,差异均有统计学意义。这与之前的研究报道相一致^[26-28],说明除颤时间可能与除颤复苏成功率密切相关,且除颤时间越早,患者除颤复苏成功率也就越高。其主要原因在于当患者心脏出现停搏后,10 s 内便会丧失意识以及运动功能,30 s 内便可能出现阿斯综合征,1 min 内自主呼吸便会停止,3 min 后便开始出现脑水肿,如未接受及时有效的治疗,随着病情不断发展,6 min 时起患者便开始出现脑细胞的死亡。因此,电除颤治疗的重要因素就是时间,随着时间的不断推移,患者的病情也逐渐严重,进一步影响电除颤治疗的效果。此外,电除颤时间<2 min、2~5 min、5~10 min 以及>10 min 患者的 E 峰、LVEF、LVEDD 以及 E/A 水平呈逐渐下降趋势,差异均有统计学意义。这与之之前报道的结果一致^[29,30]提示除颤时间可能与心脏性猝死患者的心功能存在一定相关性,且除颤时间越早,除颤后患者的心功能越佳。分析原因可能与除颤时间越晚,心脏性猝死患者心功能受损越严重有关。另外,心脏性猝死患者除颤时间与除颤复苏成功率、E 峰、LVEF、LVEDD 以及 E/A 均呈负相关关系,充分证明了上述结果,说明对于心脏性猝死患者而言,除颤时间越早,除颤复苏成功率也就越高,且除颤后患

者心功能越好。这提示我们在临床工作中应尽早对心脏性猝死患者进行除颤复苏治疗,以求在最大限度上保障患者的生命健康安全。另外,由于大部分心脏性猝死患者均发生于意外场合,从发病开始直至送至急诊抢救已然错过了心肺复苏的黄金治疗时间,从而明显降低了复苏成功率。因此,对猝死患者进行现场及时正确的急救才能为下一阶段的治疗创造有利基础。目前相关研究表明延迟复苏的主要原因包括患者自己无自备急救药物,家属不懂相关急救知识以及救护车无法及时赶到等。由此,我们应该针对上述原因制定相关干预措施,为心脏性猝死患者的电除颤治疗争取时机,以提高除颤复苏成功率。

综上所述,心脏性猝死抢救中患者除颤时间与除颤复苏成功率呈负相关关系,即除颤时间越早,患者复苏成功率越高。如何有效缩短患者发病至急诊时间,对提高患者复苏成功率具有极其重要的意义。

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