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酚妥拉明、多巴胺联合心肺复苏对心搏骤停患者的影响 *

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摘要 目的：研究酚妥拉明、多巴胺联合心肺复苏对心搏骤停患者的影响。**方法：**选择 2015 年 2 月至 2016 年 4 月在我院进行治疗的心搏骤停患者 60 名，按照治疗方法的不同分为观察组和对照组，对照组使用常规方法治疗，观察组在对照组基础上联合酚妥拉明及多巴胺治疗。观察和比较两组治疗后的临床疗效、生存情况、血清 cTnI、CK、CK-MB、MDA、SOD 水平和血流动力学参数的变化。**结果：**治疗后，观察组总病死率 20%，明显低于对照组 33.33%(P<0.05)。观察组心肺复苏后 0.5-1h 血清 cTnI 水平显著高于对照组(P<0.05)，2-24 h 血清 cTnI 水平显著低于对照组(P<0.05)；观察组心肺复苏后各时点血清 CK、CK-MB 水平均显著低于对照组(P<0.05)；观察组复苏后 24 h 的 MDA、SOD 浓度较对照组[(1.86± 1.65) μg/L vs(3.81± 1.24) μg/L、(6.58± 0.95)μg/L vs(3.74± 0.56) μg/L] (P<0.05)。心肺复苏后，观察组患者从第 2 h 开始 MAP 值明显高于对照组水平(P<0.05)；观察组患者 CO 值及 CI 值从第 6h 开始明显升高显著高于对照组水平(P<0.05)；且观察组患者 PCWP 值各时段均显著低于对照组(P<0.05)。**结论：**酚妥拉明联合多巴胺用于治疗心搏骤停患者可明显减轻患者心肌损伤，改善其血流动力学及患者预后，提高生存率，且安全性高。

关键词：酚妥拉明；多巴胺；心搏骤停；心肺复苏

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Effects of Phentolamine and Dopamine Combined with Cardiopulmonary Resuscitation on Sudden Cardiac Arrest*

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ABSTRACT Objective: To study the effects of phentolamine and dopamine combined with cardiopulmonary resuscitation on the patients with cardiac arrest. **Methods:** 60 patients with cardiac arrest who were treated from February 2015 to April 2016 in our hospital were selected and divided into the control group and the observation group according to different treatment methods. The control group was treated with routine treatment. while the observation group was treated with phentolamine and dopamine based on the control group. The changes of cTnI, CK, CK-MB levels, MDA, SOD concentration and hemodynamics were observed before and after treatment. **Results:** After treatment, the total mortality was 20% in the observation group, which was significantly lower than that of the control group (33.33%, P<0.05). The levels of cTnI in the observation group were significantly lower than those of the control group at 2 h and 24 h after the cardiopulmonary resuscitation(P<0.05). After the cardiopulmonary resuscitation, the serum levels of CK and CK-MB in the observation group were significantly lower than those in the control group (P<0.05). The concentration of MDA and SOD in the observation group were significantly higher compared with the control group [(1.86± 1.65) μg/L vs(3.81± 1.24) μg/L、(6.58± 0.95)μg/L vs(3.74± 0.56) μg/L](P<0.05). After the cardiopulmonary resuscitation, the MAP value of observation group was significantly higher than that of the control group (P<0.05). The CO value and CI value of observation group were significantly increased from the 6th day to the control group (P<0.05), and the PCWP values of observation group were significantly lower than those of the control group (P<0.05). **Conclusion:** Phentolamine combined with dopamine could effectively improve the cardiac hemodynamics and prognosis of patients with cardiac arrest, reduce the myocardial injury and enhance the survival with high safety.

Key words: Phentolamine; Dopamine; Cardiac arrest; Cardiopulmonary resuscitation

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前言

心搏骤停是目前临床上致死率及致残率较高的意外事件，

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患者发病时会出现头晕、四肢麻木、呼吸不畅及心跳停止等反应，若不及时进行正确的抢救，将增加患者的死亡风险[1,2]。目前，针对心搏骤停患者常用治疗手段为心肺复苏术，其可以为患者提供循环机械通气帮助部分患者恢复自循环，但心肺复苏术后多数患者的心搏组织及器官因缺血缺氧等原因造成损伤难以治疗[3,4]。多项研究表明在常规治疗的基础上联合酚妥拉明及多巴胺能有效治疗心搏骤停患者的器官损伤，降低死亡率并改善预后[5-7]。本研究主要探讨了酚妥拉明联合多巴胺用于心搏骤停复苏的效果及对患者心肌酶 cTnI、CK、CK-MB 水平的影响。现将结果报道如下：

1 材料与方法

1.1 一般资料

选择 2015 年 2 月至 2016 年 4 月在我院进行治疗的心搏骤停患者 60 名。纳入标准[8]：(1)符合我国心搏骤停诊断标准，患者出现大动脉搏动消失、呼吸断续及昏迷等状况；(2)年龄在 30-80 岁之间；(3)所有患者均在心搏骤停后 8 分钟内进行 CPR 术。排除标准：(1)排除其他肾脏疾病；(2)排除对研究药物严重过敏反应者；(3)排除精神病及瘫痪患者。根据治疗方法的不同将患者分为观察组及对照组。观察组 30 例患者中，男 12 例，女 18 例，年龄在 39-73 岁，平均年龄(51.56± 7.12)岁，基础病因：肺源性心脏病 8 例，支气管哮喘 10 例，冠心病 6，其他病因 6 例；对照组 30 例患者中，男 21 例，女 9 例，年龄在 41-76 岁，平均年龄(49.36± 7.92)岁，基础病因：肺源性心脏病 10 例，支气管哮喘 9 例，冠心病 6，其他病因 5 例。两组患者的一般资料比较差异均无统计学意义(P＞0.05)，具有可比性。

1.2 治疗方法

所有患者均行心肺复苏 (cardiopulmonary resuscitation，CPR)术治疗，具体为：① 为患者的气管进行插管，给予供氧支持；② 及时对患者进行胸外心搏按压，并对室颤患者辅以电击除颤；③ 为患者进行维持电解质平衡、镇静及降颅压等常规治疗；④ 给予患者抗菌药物、血管活性药物、治疗心肌药物及营养肠内药物等基础治疗药物。观察组患者在常规治疗的基础上联用酚妥拉明 (湖北信康医药化工有限公司，国药准字 H10390046，10 mg/ 支)10 mg 及多巴胺(陕西省明惠有机化工有限公司，国药准字 H10642046，5 mg/ 支)15 mg 并加入 0.9%氯化钠 20 mL 进行静脉注射治疗，并于 24 h 内重复使用该药持续泵入，持续治疗 7 天。

1.3 观察指标

研究患者进行 CPR 后，需进行血常规、肝功能、血脂及心肌酶谱等常规检查。抽取患者治疗后 0.5 h、2 h、6 h、12 h、24 h 各时段的外周静脉血，采用全自动生化仪(道尔格医疗制造公司生产)检测患者的 cTnI、CK、CK-MB 水平，观察两组患者治疗后血清 cTnI、CK、CK-MB 水平的变化。采用比色法检测患者复苏前及复苏 24 h 后血清 MDA、SOD 水平，方法为：采集患者静脉血 5 mL 进行低温分离血清，并采用 MDA、SOD 试剂盒(上海纪宁实业生产)对血清样本进行稀释，测定步骤须严格按照试剂盒使用说明进行。

疗效判定标准[9]：① 显效：在治疗后 cTnI、CK、CK-MB 恢复正常水平且患者呼吸频率每分钟 <30 次，心率 <100 次；② 有效：治疗后患者的 cTnI、CK、CK-MB 水平明显改善且呼吸频率每分钟 <40 次 /m，心率 <120 次；③ 无效：治疗后 cTnI、CK、CK-MB 水平无变化且呼吸频率及心率无任何改善。

1.4 统计学分析

选择 SPSS18.0 进行数据统计，本研究计量资料数据用均数± 标准差($\bar{x}$± s)来表示，比较使用 t 检验，计数资料以[(n)%]表示，比较采用 x^2 检验，当 P<0.05 时表示其差异具有统计学意义。

2 结果

2.1 两组患者治疗前后各时点血清 cTnI、CK、CK-MB 水平的比较

两组患者治疗前 cTnI、CK、CK-MB 水平比较差异无统计学意义(P>0.05)；两组患者进行心肺复苏后各时点的血清心肌肌钙蛋白 I(cTnI)、肌酸激酶(CK)、肌酸激酶同工酶(CK-MB)均较复苏前明显变化，观察组心肺复苏后 0.5 h-1 h 血清 cTnI 水平显著高于对照组(P<0.05)，但复苏后 2 h-72 h 血清 cTnI 水平显著低于对照组(P<0.05)，观察组心肺复苏后各时点血清 CK、CK-MB 水平均显著低于对照组(P<0.05)，详见表 1。

表 1 两组患者心肺复苏后各时点血清 cTnI、CK、CK-MB 水平的比较($\bar{x}$± s)

Table 1 Comparison of the serum cTnI, CK and CK-MB levels at different time points after cardiopulmonary resuscitation between two groups ($\bar{x}$± s)

Indexes	Groups	Before treatment	Monitoring time						
			0.5	1	2	6	12	24	72
cTnI	Observation group	0.15± 0.01[c]	2.83± 0.08[a]	5.33± 0.65[a]	9.68± 1.56[a]	11.02± 1.66[a]	9.54± 1.16[a]	9.10± 1.44[a]	8.92± 1.09[a]
	Control group	0.17± 0.03	1.98± 0.04	3.29± 0.59	15.72± 2.14	19.32± 2.78	18.51± 2.33	17.69± 2.14	16.72± 2.51
CK	Observation group	220.56± 35.17[c]	186.12± 20.01[a]	216.33± 30.78[a]	433.69± 68.56[a]	647.32± 97.22 a	592.83± 87.68[a]	618.83± 79.49[a]	422.76± 62.66[a]
	Control group	221.36± 33.82	218.36± 29.32	236.48± 33.71	667.91± 88.42	908.72± 126.47	889.56± 131.56	870.92± 130.55	656.81± 90.66
CK-MB	Observation group	12.36± 3.58[c]	17.65± 2.44[a]	19.03± 2.88[a]	28.66± 3.11[a]	31.12± 4.12[a]	29.46± 3.02[a]	31.25± 4.39[a]	28.05± 3.56[a]
	Control group	11.18± 2.17	19.02± 2.99	21.32± 3.06	45.78± 6.55	49.05± 7.14	48.25± 6.89	46.88± 6.59	45.62± 6.69

Note: Compared with the control group [a]P<0.05, Compared with the control group [c]P>0.05.

2.2 两组复苏后各时点血流动力学参数的比较

两组患者心搏骤停患者在心肺复苏前平均血压(MAP)、输

出量(CO)、心指数(CI)、肺毛细血管楔嵌压(PCWP)水平等均无明显差异(P>0.05)；心肺复苏后，观察组患者从第 2 h 开始 MAP 值明显高于对照组水平(P<0.05)；观察组患者 CO 值及 CI 值从第 6 h 开始明显升高显著高于对照组水平(P<0.05)；且观察组患者 PCWP 值各时段均显著低于对照组(P<0.05)，具有统计学意义，详见表 2。

表 2 两组治疗后血流动力学参数比较分析($\bar{x}\pm s$)

Table 2 Comparison of the hemodynamic parameters analysis between two groups($\bar{x}\pm s$)

Indexes	Groups	Before treatment	Monitoring time					
			0.5	1	2	6	12	24	72
MAP (mm/Hg)	Observation group	52.75± 4.98[c]	57.68± 5.24[c]	55.84± 8.12[c]	68.92± 5.67[a]	76.22± 6.75[a]	81.12± 5.32[a]	85.64± 6.72[a]	90.67± 7.01[a]
	Control group	53.43± 5.66	56.78± 5.72	58.26± 7.64	62.85± 6.71	63.76± 5.66	65.82± 6.42	67.83± 4.92	65.74± 3.44
CO(L/min) 4-8	Observation group	2.14± 0.61[c]	4.52± 0.91[c]	4.88± 1.51[c]	6.62± 1.56[c]	7.12± 2.34[a]	7.44± 2.30[a]	7.65± 1.81[a]	7.94± 2.41[a]
	Control group	2.36± 0.57	3.33± 51.25	4.10± 0.76	4.16± 0.88	4.32± 0.78	4.40± 0.93	4.51± 0.98	4.62± 1.62
CI(L/mi.m^2)^2 2.5-4.0	Observation group	1.76± 0.53[c]	1.88± 0.92[c]	1.76± 0.21[c]	2.83± 0.92[c]	3.12± 1.28[a]	3.68± 1.26[a]	3.77± 1.31[a]	3.68± 1.24[a]
	Control group	1.52± 0.41	1.68± 0.09	1.70± 1.20	1.94± 1.23	2.68± 0.92	2.15± 1.25	2.30± 1.14	2.41± 1.21
PCWP (mm/Hg) <12	Observation group	10.61± 3.62[c]	11.46± 3.12[a]	11.92± 4.15[a]	12.68± 2.72[a]	9.62± 2.89[a]	9.72± 2.94[a]	8.34± 1.15[a]	7.81± 1.98[a]
	Control group	11.03± 3.94	13.62± 2.34	14.76± 2.34	16.48± 3.25	16.92± 2.61	18.92± 1.86	19.52± 3.24	18.83± 2.81

Note: Compared with the control group [a]P<0.05, Compared with the control group [c]P >0.05.

2.3 两组患者复苏前后血清 MDA 及 SOD 水平的比较

两组患者复苏前 MDA 及 SOD 水平对比无明显差异(P>0.05)，复苏后 24 h 观察组复血清 MDA 浓度显著低于对照组(P<0.05)，血清 SOD 浓度明显高于对照组(P<0.05)，详见表 3。

表 3 两组患者复苏前后 MDA 及 SOD 浓度对比分析(μg/L)

Table 3 Comparison of MDA and SOD concentration analysis before and after recovery between two groups(μg/L)

Groups	n	MDA		SOD	
		Before resurrection	After resuscitation for 24 h	Before resurrection	After resuscitation for 24 h
Observation group	30	5.26± 1.01[c]	1.86± 1.65[a]	0.93± 0.26[c]	6.58± 0.95[a]
Control group	30	5.13± 0.99	3.81± 1.24	1.16± 0.51	3.74± 0.56

Note: Compared with the control group before treatment [c]P>0.05; Compared with the control group after treatment [a]P<0.05.

2.4 两组患者治疗后不良反应发生情况的比较

治疗后，两组患者均出现意识模糊、嗜睡、心功能不全、呼吸困难、恶心、呕吐、白细胞减少或嗜酸粒细胞增加等不良反应，且观察组患者的不良反应发生率明显低于对照组(P<0.05)，详见表 4。

表 4 两组患者治疗后不良反应发生情况的比较[例(%)]

Table 4 Comparison of the incidence of adverse reactions between two groups after the treatment [n(%)]

Groups	n	Consciousness, drowsiness	Mild heart failure	Mild breathing difficulty	Nausea, vomiting	Leukopenia or eosinophilia
Observation group	30	24(80.00)[a]	20(66.67)[a]	16(53.33)[a]	7(23.33)[a]	5(16.67)[a]
Control group	30	28(93.33)	23(76.67)	25(83.33)	18(60.00)	7(23.33)

Note: Compared with the control group [a]P<0.05.

2.5 两组患者心肺复苏术后生存情况的对比

观察组心肺复苏术后(CPR)的总病死率为 20%，明显低于对照组(33.33%)(P<0.05)，详见表 5。

3 讨论

近年来，因生活方式的转变，心搏骤停患者呈逐年上升趋势，且大多患者发病于院前，因其发病急的特点使得多数患者无法得到及时正确的抢救，从而严重影响了心肺复苏术对其的治疗效果[10,11]。目前，我国针对心搏骤停患者常采用心肺复苏术，让患者在发病 8 分钟内得到及时救治，减轻因缺血缺氧造成的器官及心肌损伤[12]。但通过多年的临床观察结果显示心肺复苏术成功后的患者也可能因器官造成损伤且无良好的预后

措施而死亡。酚妥拉明作为一种 α- 受体阻滞剂多用于血管痉挛等疾病,具有改善血流灌注及微循环的作用,可增强机体心肌收缩力,改善心肺功能并帮助患者利尿排毒,有效减少心脏负荷[13,14]。多巴胺作为一种 β- 受体激动剂可根据用药剂量达到不同的治疗效果[15,16]。患者心搏骤停后,心肌冠脉处于缺血缺氧等状态,心肌功能异常导致血压降低及血流动力学等指标异常影响机体正常运作 [17]。本研究采用中剂量多巴胺帮助扩张血管、增强心肌缩力及增加心输出量,其可有效治疗患者心肌抑郁增加机体肾脏血流量, 研究患者在心肺复苏后其平均血压(MAP)、输出量(CO)、心指数(CI)等均低于正常水平,肺毛细血管楔嵌压(PCWP)明显高于正常值,治疗后,患者的血流动力学水平较常规治疗的患者改善更明显,证明联合用药对患者的血流动力学水平作用明显。

表 5 两组患者 CPR 后病死率的比较[例(%)]

Table 5 Comparison of the mortality after CPR between two groups [n (%)]

Groups	n	Number of deaths				Total mortality rate (%)
		After successful CPR for 1 day	After successful CPR for 5 days	After successful CPR for 15 days	After successful CPR for 30 days	
Observation group	30	1(3.33)[a]	3(10.00)[a]	1(3.33)[a]	1(3.33)[a]	6(20.00)[a]
Control group	30	1(3.33)	5(16.67)	3(10.00)	1(3.33)	10(33.33)

Note: Compared with the control group [a]P<0.05.

本次心搏骤停患者行 CPR 术后, 心肌功能因缺氧缺血等原因不可避免都受到不同程度的损伤, 从而导致心肌酶 cTnI、CK、CK-MB 水平明显升高[18]。研究表明,心肌肌钙蛋白 I(cTnI)是心肌肌肉收缩的调节蛋白,正常人体中 cTnI 水平较低,一旦机体出现心肌损伤, 则 cTnI 水平会上升 [19]。同工胰 -MB(CK-MB)主要来源于机体的心脏,其临床灵敏度较高可提升诊断准确度,因此 CK-MB 可作为心肌的一个重要标志物[20]。肌酸激酶(CK)主要分布于心肌部位,当患者出现肌肉类疾病及心肌炎症,CK 水平明显上升[21]。本次研究患者行电出颤时心肌细胞及心脏微血管内皮细胞都受到一定程度损伤,因此为降低心肌损伤程度采用多种方法治疗行 CPR 术患者, 经研究结果显示经由两种方法治疗的患者心肌酶 cTnI、CK、CK-MB 水平均显著降低,但采用酚妥拉明联合多巴胺治疗的患者下降水平更显著, 证明联合用药可显著降低电出颤后造成的心肌功能损伤,因此我们可根据 cTnI、CK、CK-MB 的水平判断患者的心肌状况。MDA、SOD 是机体内氧化还原系统,MDA 是人体器官中的氧化损伤因子对器官损伤及降低细胞功能等有重要的影响,SOD 具有还原的作用可抵抗 MDA 对器官组织的损伤,本次研究患者行 CPR 术后,联合用药患者复苏后及复苏后 24hMDA、SOD 浓度较行常规治疗的患者改善更明显, 证明联合用药可显著降低器官组织损伤[22]。多数患者行 CPR 术后,均出现不同程度的不良反应,严重降低临床治疗效果,例如意识模糊、心功能不全、呼吸不畅、恶心等不良反应,酚妥拉明联合多巴胺治疗的患者不良反应发生率明显低于常规治疗的患者,效果显著值得推广。本次研究中联合用药治疗的患者病死率为 20%,行常规治疗的患者病死率为 33.33%,联合用药的患者疗效更好,存活率更高。

综上所述,酚妥拉明联合多巴胺用于治疗心搏骤停患者可明显减轻患者心肌损伤,改善其血流动力学及患者预后,提高生存率,且安全性高。

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