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限制性输液与充分液体复苏在感染性休克患者围手术期麻醉中的应用研究

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摘要 目的:探究限制性输液与充分液体复苏在感染性休克患者围手术期麻醉中的应用,从而为患者治疗提供相关科学依据。**方法:**回顾性分析 2007 年 2 月至 2015 年 6 月期间因感染性休克入院接受治疗的 82 例患者的临床资料,按输液方式的不同分为研究组(限制性输液)与对照组(充分液体复苏)各 41 例,观察两组患者转归情况,记录患者心率(HR)、平均动脉压(MAP)、中心静脉压(CVP)、动脉血氧分压(PaO₂)、出血量、总输液量、尿量、术后机械通气时间及 ICU 住院时间。**结果:**术后研究组患者出现弥散性血管内凝血(DIC)5 例、成人呼吸窘迫综合征(ARDS)3 例,2 例病情控制不佳者转为多器官功能障碍综合征(MODS),1 例死亡,总发生率为 26.83%;对照组患者出现 DIC 8 例,ARDS 7 例,MODS 5 例,最终出现 3 例死亡,总发生率为 56.10%,两组患者术后转归状况比较,差异有统计学意义($P<0.05$);研究组患者 MAP、CVP、HR、出血量、总输液量及尿量等指标低于对照组,差异有统计学意义($P<0.05$),研究组患者 PaO₂ 显著高于对照组,差异有统计学意义($P<0.05$);研究组患者术后机械通气时间及 ICU 住院时间比对照组短,差异有统计学意义($P<0.05$)。**结论:**限制性输液较充分液体复苏能够显著改善感染性休克患者组织血流灌注状况,术中出血量少、术后并发症少,效果更显著,更适合在围手术期麻醉中使用。

关键词:限制性输液;充分液体复苏;感染性休克;手术麻醉

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Application of Limited Fluid Resuscitation and Adequate Fluid Resuscitation in Perioperative Anesthesia in Patients with Septic Shock

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ABSTRACT Objective: To explore the application of limited fluid resuscitation and adequate fluid resuscitation in perioperative anesthesia in patients with septic shock, so as to provide scientific basis for the treatment of patients. **Methods:** 82 cases of patients with septic shock admitted to hospital to accept treatment from February 2007 to June 2015 as the research object, the research data was retrospectively analyzed and the patients were randomly divided into study group(limited fluid resuscitation) and control group(adequate fluid resuscitation), 41 cases in each group. Observed the patients prognosis of two groups and recorded the heart rate (HR), mean arterial pressure (MAP), central venous pressure (CVP), arterial oxygen partial pressure (PaO₂), bleeding volume, total infusion, urine volume, postoperative mechanical ventilation time and ICU hospitalization time. **Results:** There were 5 cases of disseminated intravascular coagulation (DIC) in research group after the operation, 3 cases of adult respiratory distress syndrome(ARDS), 2 cases of poor control of the disease were converted to multiple organ dysfunction syndrome (MODS), 1 cases of death, total incidence was 26.83%; while 8 cases of DIC, 7 cases of ARDS, 5 cases of MODS, 3 cases of death, total incidence was 56.10% in control group,the difference was statistically significant of postoperative outcome of two groups ($P<0.05$); The indexes of MAP, CVP, HR, blood loss, total infusion volume and urine volume in the study group were lower than those in the control group, the difference was statistically significant ($P<0.05$), the PaO₂ in the study group was significantly higher than that in the control group, the difference was statistically significant ($P<0.05$). The time of mechanical ventilation and ICU stay in the study group were shorter than those in the control group, the difference was statistically significant ($P<0.05$). **Conclusion:** Compared with fully liquid recovery, Restrictive transfusion could significantly improve tissue blood flow perfusion in patients with septic shock, less intraoperative blood loss, postoperative complications, more effective, more suitable for use in the perioperative anesthesia.

Key words: Limited fluid resuscitation; Fluid resuscitation; Septic shock;Surgical anesthesia

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前言

在外科手术及围手术期,感染性休克较为常见,相关研究表明胆道感染、急性腹膜炎、绞窄性肠梗阻和泌尿系感染等疾病常造成患者出现感染性休克,患者原发感染灶较为明显。目前常见的处理方式是对感染患者进行正确液体复苏,随后及时进行手术,能够有效纠正患者休克^[1-3]。不合理的液体复苏必然导致液体失衡、全身水肿和体质量增加,导致术后并发症发生率的升高,目前围手术前补液的观点主要集中在两个方面,有人认为术前禁食禁水致患者出现血容量不足,术中麻醉药物的应用,促使血液重新分布,加上手术创伤,导致有效血容量减少,需要术中补充大量的液体,即充分液体复苏;另外有人认为手术造成体内大量激素分泌,导致水钠潴留,所以需要控制液体的补充,即限制性输液。本研究主要对感染性休克患者围手术期麻醉中的输液方式,包括限制性输液与充分液体复苏两种

进行对比,现将本研究内容报道如下。

1 资料与方法

1.1 一般资料

选择 2007 年 2 月至 2015 年 6 月期间因感染性休克入院接受治疗的 82 例患者作为研究对象,其中包括男性 38 例,女性 44 例,年龄 37-49 岁,平均年龄(41.6±3.21)岁。其中急性腹膜炎 37 例,急性梗阻性化脓性胆管炎 26 例,急性坏死性胰腺炎 13 例、其他感染类型 6 例,所有患者疾病诊断由经验丰富的主治医师确诊^[4]。本研究确定所有患者及家属的知情同意,并或医学伦理委员会批准。将研究对象进行随机分组,研究组采用限制性输液,对照组采用常规充分液体复苏,对比患者年龄、性别、脉搏、手术时间、疾病类型等指标对比,差异均无统计学意义($P>0.05$),两组具有均衡可比性,见表 1。

表 1 两组患者一般资料比较

Table 1 Comparison of general information between two groups

Groups	n	Gender (Male/Female)	Age (Years)	Pulse (100 times /min)	Operation time (min)	Disease types			
						Acute peritonitis	Acute obstructive suppurative cholangitis	Acute necrotizing pancreatitis	Other infections
Study group	41	19/22	40.7±5.87	1.38±0.67	168.9±12.87	18	12	7	4
Control group	41	19/22	41.4±6.65	1.41±0.54	171.4±10.79	19	14	6	2
t/x ²		0.000	-0.505	-0.223	-0.953		0.924		
P		1.000	0.615	0.824	0.343		0.820		

1.2 输液方法

对照组:患者采用常规充分液体复苏方式^[5],具体方式为在第 1 个小时内将 100-1500 mL 液体输入体内,保证患者平均动脉压(MAP)超过 70 mmHg,同时维持尿量在 1-1.5 mL/(kg·h),根据患者具体情况随时对输液量与输液速度进行控制。研究组:患者采用限制性输液方式^[6],具体方法为第 1 个小时内输入液体 500-1000 mL,维持患者 MAP 在 50-70 mmHg 左右,尿量控制在 0.5-1 mL/(kg·h)范围内,同时注意调整输液量与输液速度。

1.3 观察指标

① 观察两组患者转归情况,包括术后并发症;② 测量 MAP、CVP、HR;③ 记录出血量、总输液量及尿量;④ 统计术后机械通气时间及 ICU 住院时间。

1.4 统计分析

本研究所有数据均采用 SPSS18.0 进行统计分析,计量数据资料采用均数±标准差形式表示,数据组间对比采用独立样本 t 检验;计数资料采用百分比形式表示,采用 χ^2 检验, $P<0.05$ 为差异有统计学意义。

2 结果

2.1 两组患者转归状况比较

所有纳入研究的患者均顺利完成手术,但术后研究组患者出现弥散性血管内凝血(DIC)5例、成人呼吸窘迫综合征(ARDS)3例,在这其中存在2例病情控制不佳者转为多器官功能障碍综合征(MODS),最终出现1例死亡,总发生率为26.83%;对照组患者出现DIC8例,ARDS7例,MODS5例,最终出现3例死亡,总发生率为56.10%。两组患者术后转归状况进行对比,差异无显著统计学意义($\chi^2=7.235$, $P=0.007$),见表 2。

表 2 两组患者转归状况比较

Table 2 Comparison of outcome between two groups

Groups	n	DIC		ARDS		MODS		Death	
		n	%	n	%	n	%	n	%
Study group	41	5	12.20	3	7.32	2	4.88	1	2.44
Control group	41	8	19.51	7	17.07	5	12.20	3	7.32
χ^2		0.823		1.822		1.406		1.051	
P		0.364		0.177		0.236		0.305	

2.2 两组患者手术相关指标比较

研究组患者 MAP、CVP、HR、出血量、总输血量及尿量等

指标显著低于对照组患者, 差异有统计学意义($P<0.05$), PaO_2

则显著高于对照组, 差异有统计学意义($P<0.05$), 见表 3。

表 3 两组患者手术相关指标比较

Table 3 Comparison of operation related indexes between two groups

Groups	n	MAP (mmHg)	CVP (mmHg)	PaO_2 (mmHg)	HR (Time/min)	Blood loss (mL/h)	Total infusion volume(mL)	Urine volume (mL/h)
Study group	41	61.4± 5.57	8.8± 3.69	191.4± 12.57	63.1± 6.49	127.6± 15.33	1943.6± 117.56	51.4± 9.58
Control group	41	75.7± 4.38	11.3± 5.26	153.8± 11.49	71.2± 5.49	186.9± 16.78	3654.4± 123.49	68.8± 11.23
t		-12.922	-2.491	14.137	-6.101	-16.706	-64.249	-7.548
P		0.000	0.015	0.000	0.000	0.000	0.000	0.000

2.3 两组患者术后指标比较

两组患者手术后需要进行机械通气时间, 并在 CIU 病房观察, 研究组患者术后机械通气时间及 ICU 住院时间分别为 $(3.5 \pm 1.14)\text{min}$ 、 $(8.7 \pm 2.38)\text{min}$, 分别低于对照组的 $(6.2 \pm 2.32)\text{min}$ 、 $(12.9 \pm 4.47)\text{min}$, 差异有统计学意义($t=6.688, 5.311, P$ 均 <0.05)。

3 讨论

感染性休克的主要临床特征为患者存在全身性炎症反应, 从而进一步导致机体内出现代谢紊乱、微循环障碍及多器官衰竭。相关研究表明感染性休克患者病死率超过 50.0%, 由于患者机体内血流动力学指标变化较为复杂, 使得患者心肺功能下降, 若补液速度过快导致心脏无法承受^[7-9], 因此, 感染性休克患者在围手术期麻醉过程中进行合理有效的液体复苏对抢救及患者预后效果显得尤为重要。液体复苏是指补充患者血容量, 使得机体内维持有效循环血量, 在传统输液方式中, 主要采用充分液体复苏方案, 但限制性输液方案逐步受到重视。

目前, 临床上认为, 在感染性休克中, 合理的液体复苏方式为早期进行充分液体复苏^[6], CVP 需要在 6 h 内控制 8-12 mmHg 左右, 但需要进行术后机械通气的患者需要控制在 12-15 mmHg、MAP ≥ 65 mmHg、中心静脉血氧饱和度 $\geq 70\%$ 、尿量 $\geq 0.5 \text{ mL}/(\text{kg} \cdot \text{h})$ 。但需要注意的是液体复苏的主要目的是维持机体内有效循环血量, 使得组织灌注增强, 但不需要无节制进行大量补液, 分析原因主要是由于患者因休克导致其微循环出现显著改变, 毛细血管扩张、血浆外渗, 使得患者机体内液体分布状况改变, 组织间隙内液体较多, 液体输入量显著高于液体输出量, 液体出现正平衡^[10-12]。若液体分布异常的情况得不到有效改善, 则会导致患者出现组织器官缺氧、水肿、代谢性损伤, 且肺间质水肿后导致缺氧症状加剧, 甚至导致 ARDS、MODS 等严重并发症, 威胁患者生命健康。限制性输液方式能够通过控制输液速度与输血量进行控制, 在必要情况下加入血管活性药物, 能够有效维持患者机体内重要器官血供, 同时将血压维持在较低水平, 使得患者体液能够有效复苏^[13-15]。

本次研究结果显示研究组患者与对照组患者相比, 两者均能实现有效复苏, 感染性休克患者在麻醉状态下往往存在呼吸抑制, 患者心肺功能下降^[16,17], 因此, 若输入液体量较大, 使得心脏前负荷显著增加。研究组患者采用限制性输液, 能够有效维持重要脏器基本血供, 且手术相关指标包括出血量、 PaO_2 以及术后转归指标等均显著优于对照组患者, 数据差异有显著统计

学差异($P<0.05$)。研究组患者 ARDS、MODS 等严重并发症发病率降低, 并发症发生危险能够控制在较低水平。分析原因可能是患者限制性输液, 使得患者机体内液体正平衡程度较轻, 使得患者组织间隙液较少, 降低组织水肿程度^[18-20]。

综上所述, 感染性休克患者围手术期麻醉时补液方式可以采用限制性输液, 可改善患者组织血流灌注状况, 减少术中出血, 降低术后并发症发生率, 值得在临床上推广应用。

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明胚胎在解冻半小时后即恢复了氨基酸代谢能力。

综上所述,人早期胚胎在解冻后约 0.5 h 就已开始恢复代谢状态,已开始进行氨基酸代谢,且氨基酸代谢水平与冷冻前基本相同;人早期胚胎解冻后并不一定需要在胚胎培养液中培养 2~4 h 后再进行移植,可提前移植,有助于培养时间的缩短,减少培养环境对胚胎带来的影响,但提前移植能否提高妊娠率还有待研究。

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