

不同液体复苏对失血性休克大鼠肠粘膜的影响

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摘要 目的:观察不同液体复苏对失血性休克大鼠肠粘膜的影响以及肠粘膜的变化。**方法:**利用大鼠失血性休克模型以及不同的补液方式,在复苏后 120 分钟时处死大鼠,取回肠 4 cm,做病理切片并根据 Chiu 等方法评估回肠黏膜上皮损伤指数。**结果:**液体复苏组的肠粘膜损伤程度小于休克不补液组($p < 0.05$),而限制型液体复苏组的肠粘膜损伤程度小于充分液体复苏组($p < 0.05$)。**结论:**通过本实验对肠粘膜的观察可以得出,对于失血性休克,液体复苏时有效的抗休克方式,而对于复苏的方式来说,从肠黏膜的保护方面来说,限制型液体复苏是优于传统的充分液体复苏的。

关键词:限制性液体复苏;失血性休克;肠粘膜

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Effect of different fluid resuscitation on intestinal mucosa in rats with hemorrhagic shock

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ABSTRACT Objective: To observe different fluid resuscitation of uncontrolled hemorrhagic shock rats intestinal mucosa and influence of bowel mucosa changes. **Methods:** By using rat uncontrolled hemorrhagic shock model and different rehydration ways, the rats were killed 120 minutes after recovery, taking the ileum 4 cm, doing pathological and according to the methods of assessment Chiu ileum mu-cosal surfaces damage index. **Results:** fluid resuscitation group intestinal mucosa damage degree of less than shock not rehydration group ($p < 0.05$), and restricted type fluid resuscitation group intestinal mucosa damage degree of less than large amounts of fluid resuscitation group ($p < 0.05$). **Conclusion:** through the experiment of bowel mucosa observations can be concluded that the fluid resuscitation for uncontrolled hemorrhagic shock, when effective way, but for resistance to shock recovery way, restricted type fluid resuscitation is superior to the traditional fully fluid resuscitation.

Key words: limited resuscitation; haemorrhagic shock; The intestinal mucosa

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前言

失血性休克是创伤及外科手术中较常见的危重症,在失血性休克中血液优先供应心脑肾等器官,肠道缺血缺氧则最早最严重,肠黏膜屏障功能下降,肠腔内大量细菌或内毒素向肠腔外迁移,此过程即细菌移位或内毒素移位,后统称细菌移位。该过程在复苏后仍可持续存在。近年来认为肠道是“外科应急条件下的中心器官”,肠道的缺血-再灌注损伤是休克创伤的共同通路。许多危重患者的 SIRS 和 MODS 的多数病原体均来自胃肠道。减少细菌移位,保护肠黏膜屏障功能成为治疗和研究工作的中心环节。本文通过不同补液方式对粘膜损伤程度研究,以期临床外科实践提供理论依据。

1 材料与方法

1.1 实验动物与分组

实验动物种鼠购自新疆石河子大学动物试验中心。55 只

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雄性 Sprague-Dawley 大鼠,体重 250-350g。随机分为四组:限制输液组(15 只)、常规输液组(15 只),休克不输液组(15 只),对照组(10 只)。

1.2 实验动物模型的建立以及方法

失血性休克模型制备 整个模型分为 3 个时期:第 1 期:急性创伤出血期(0~30 min)(简称院前期):水合氯醛麻醉大鼠,分离左颈总动脉和右颈静脉,分别插管,血压平稳 5min 后开始计时,并同时从颈动脉以每分钟 0.2 mL / 100g 的速率放血,使 MAP 在 15 min 内降至 40~45 mmHg,然后根据血压的变化放出或回输少量血液以维持 MAP 在 40~45 mmHg 之间 15min。第 2 期:急救复苏期(30~60min)(简称急救期):在实验的 30min 后马上实施各种复苏措施,并且吸氧以及采取全身温度控制等措施。第 3 期:止血治疗观察期(60~120 min)(简称治疗期),在第 2 期结束后以乳酸林格液与全血按 2:1 的体积比进行充分复苏继续维持血压在休克前水平的 90%。复苏后 120min 处死动物,并在无菌操作下开腹,距回肠瓣 5 cm 处取回肠 4 cm,生理盐水洗净,用 10% 甲醛固定,常规取材制片,HE 染色。全程使用恒温垫保持肛温在(37± 0.5)℃。实验过程为 120 min。

1.3 实验分组

对照组(假处理组):颈动静脉插管,不建立休克模型及输

液。

充分补液组:造成休克模型后,在急救期静脉输入乳酸林格液维持 MAP 在 90 mmHg 并且持续 30 min。

限制补液组:造成休克模型后,在急救期静脉输入乳酸林格液维持 MAP 在 60mmHg ,并且持续 30 min。

休克不输液组:建立休克模型后,不予液体复苏,维持 60 min。

1.4 检测项目与方法

实验 120min 时处死动物, 无菌操作下开腹, 距回肠瓣 5 cm 处取回肠 4 cm,生理盐水洗净,用 10%甲醛固定,常规取材制片,HE 染色以及 PAS 特染。并请两位副高以上病理科医生采用双盲方法光镜下给予回肠黏膜损伤分级, 根据 Chiu 等方法评估回肠黏膜上皮损伤指数, 即将小肠黏膜损伤分为 6 级: 0- 正常黏膜绒毛结构;I- 肠黏膜绒毛顶端上皮下间隙增宽; II - 绒毛上皮下间隙进一步扩大, 绒毛尖端上皮抬高与固有膜剥离; III - 绒毛两边上皮成块脱落; IV - 上皮完全脱落, 仅存固有膜

结构;V- 黏膜固有膜崩解, 出现出血和溃疡。

1.5 统计学分析

运用 SPSS13.0 统计软件包进行数据分析处理, 采用的统计学方法有: Kmskal-WallisH 检验和 Nenenyi 法检验, 以 P<0. 05 为检验水准。

2 结果

PAS 染色显微镜下观察, 对照组大鼠小肠粘膜基本正常, 仅少数出现绒毛上皮轻度受损, 其余三组均有不同程度的绒毛膜损伤,其中以休克不补液组损伤最为严重, 镜下可见绒毛两侧有上皮层与固有层大量分离、绒毛破损伴固有层毛细血管暴露及中性粒细胞增多及固有层破坏、出血和溃疡等, 在两种液体复苏组中, 限制补液组的肠黏膜损伤明显小于充分补液组, 镜下可见绒毛顶端上皮下间隙增大、上皮下间隙扩展, 少数为绒毛破损伴有固有层的破坏等, 而充分补液组兼于充分补液组与休克不补液组之间。

表 1 不同处理组间肠粘膜损伤分级比较
Table1 Comparison of intestinal injury scale among the different groups

肠粘膜损伤分级 Intestinal mucosa grading	组别 group				X ²	P
	对照组 ▲ △ The control group	充分补液组 ▲ Fully rehydration group	限制补液组 ▲ △ Limit rehydration group	休克不补液组 Shock not rehydration group		
0 级 0 level	9	0	0	0	33.59	0.00
I 级 I level	1	0	2	0		
II 级 II level	0	4	9	1		
III 级 III level	0	6	2	7		
IV 级 IV level	0	4	2	4		
V 级 V level	0	1	0	3		
合计 total	10	15	15	15		

两两组间比较:▲与休克不补液组比较 P<0.05,△与充分补液组比较 P<0.05
Pairwise comparison between groups: ▲Group compared with shock not rehydration P<0.05, △With full rehydration group compared P<0.05

运用 Kmskal-WallisH 检验法进行组间比较, 四组肠黏膜损伤程度均有统计学意义 (p<0.05) 结果见上表 1, 运用 Nenenyi 法进行两两组间比较后得出, 除充分补液组与休克不补液组之间无统计学差异(p=0.217)外, 其余组别两两间差异均有统计学的意义(p<0.05)。并得出, 对于失血性休克大鼠, 进行液体复苏(包括限制性补液和充分补液)后的大鼠肠黏膜的损伤程度要比休克不补液的大鼠肠黏膜损伤程度小。而对于两种液体复苏的比较而言, 限制性补液组的大鼠肠粘膜损伤比充分补液组的大鼠肠黏膜损伤程度小, 而且具有统计学意义 (p<0.05)。

3 讨论

对于失血性休克, 相应的液体复苏方案有很多选择, 限制性补液已较广泛地应用于创伤或失血性休克复苏中。限制液体复苏的目的是通过限制液体输入量, 使血压维持在一个较低的水平范围, 充分调动机体的保护性代偿功能, 保证心、脑、肾等重要脏器的血流灌注, 同时减轻血液的过度稀释, 减轻酸中毒, 不破坏机体本身的凝血机制, 从而降低病死率, 改善预后。但对于胃肠道而言, 机体有效循环血量的减少, 并且血液的重新分配, 导致的肠道的低灌注, 使肠道处于缺血缺氧状态, 肠黏膜屏障功能下降以及破坏, 而出现细菌移位。而给予液体复苏后,

虽然机体有效循环血量增加,使肠道供血相应增加,但是又继而出现缺血-再灌注损伤,就会对肠道进行第二次打击。通过本实验大鼠肠系膜的损伤程度可以得出,液体复苏可以减轻失血性休克时肠黏膜的损伤程度,而且不同的液体复苏方式在减轻黏膜损伤的程度是不同的,通过本实验,限制性液体复苏是可以明显减轻肠黏膜的屏障功能的损伤的,而充分液体复苏虽然也能减轻肠黏膜的损伤,但是减轻效果并不明显,而且其损伤程度与休克不补液组没有统计学的差异($p=0.217$),因而,从这一角度来说,限制性液体复苏是优与充分液体复苏的不仅仅在与减少补液量,减轻血液稀释,减轻酸中毒,而且还会减轻肠道屏障的损伤程度。

综上所述,在控制性失血性休克动物模型,限制性液体复苏以较少的补液量,较低的血压既可以保证心脑肾重要脏器的血供,减少出血,不破凝血机制,同时又可以减少胃肠道因缺血以及因缺血-再灌注而造成的胃肠粘膜功能损伤。

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