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血液净化治疗肾综合征出血热合并急性肾功能衰竭的疗效分析

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摘要 目的:探讨血液净化治疗肾综合征出血热合并急性肾功能衰竭的疗效。**方法:**选取了 60 例肾综合征出血热合并急性肾功能衰竭患者,按住院单双号分为两组,观察组(31 例) 采用血液透析治疗,对照组(29 例) 采用连续性静脉 - 静脉血液滤过法治疗,观察并记录两组患者肾功能相关指标、血清离子、血常规相关指标及治疗期间不良反应情况,评估血液净化治疗肾综合征出血热合并急性肾功能衰竭的疗效。**结果:**治疗前两组 K^+、HCO_3^-、血尿素氮(BUN)、血清肌酐(Cr)等指标无统计学差异(P>0.05),治疗后两组 K^+、BUN、Cr 等指标均明显降低,且观察组上述指标低于对照组(P<0.05);治疗后两组 HCO_3^- 水平升高,且观察组高于对照组(P<0.05),治疗前,两组血红蛋白(Hb),红细胞压积(Hct),血小板(PLT)无统计学差异(P>0.05),治疗后两组 Hb,Hct,PLT 均升高(P<0.05),但组间比较没有统计学差异(P>0.05),随访 1 年期间,观察组患者 6 个月和 12 个月生存率明显高于对照组(P<0.05)。治疗期间,两组不良反应率无统计学差异(P>0.05)。**结论:**血液透析对肾综合征出血热合急性肾功能衰竭具有较好的治疗效果,能调节体内电解质平衡,改善肾功能,提高生存率,改善血液状态的效果与连续性静脉 - 静脉血液滤过法相当。

关键词:肾综合征出血热;急性肾功能衰竭;血液透析

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Therapeutic Effect of Blood Purification on Hemorrhagic Fever with Renal Syndrome Combined with Acute Renal Failure

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ABSTRACT Objective: To discuss the therapeutic effect of blood purification on hemorrhagic fever with renal syndrome combined with acute renal failure. **Methods:** 60 patients with hemorrhagic fever with renal syndrome combined with acute renal failure were selected, and they were divided into two groups according to the odd and even number of hospitalization. The observation group (31 cases) received hemodialysis therapy. The control group (29 cases) received veno-venous hemofiltration therapy. The renal function, serum ion, blood routine indexes and the incidence of adverse reactions during treatment was detected and compared between two groups. **Results:** There were no statistical significance on K^+, HCO_3^-, BUN, Cr between two groups (P>0.05). After treatment, the K+, BUN, Cr levels were decreased in two groups (P<0.05). The values of observation group were lower than those of the control group (P<0.05). The level of HCO_3^- was increased in two groups, and it was higher in observation group than that of the control group (P<0.05). Before treatment, there was no statistical significance on Hb, Hc, PLT between two groups (P>0.05). After treatment, the Hb, Hc, PLT levels were increased in two groups (P<0.05), but there were no statistical significance between two groups (P>0.05). During 1 year of follow-up, the 6 months and 12 months survival rate of observation group was higher than that of the control group (P<0.05). During treatment, there were no statistical significance on the incidence of adverse reactions between two groups (P>0.05). **Conclusions:** The hemofiltration therapy has a good therapeutic effect on blood purification on hemorrhagic fever with renal syndrome combined with acute renal failure, and it can regulate the electrolyte balance, improve the renal function and increase the survival rate, which is equivalent to veno-venous hemofiltration therapy in amelioration of blood state.

Key words: Hemorrhagic fever with renal syndrome; Acute renal failure; Hemodialysis

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前言

急性肾功能衰竭是肾综合征出血热的主要并发症和致死因素,病情危急,病发时患者全身小血管及毛细血管广泛受损,液体大量外渗,进入少尿期[1]。少尿期的患者血液呈稀释状态,内环境不稳定,水电解质平衡紊乱,容易诱发心衰肺水肿、高血容量综合征等严重并发症,进而提高死亡风险[2,3]。临床常采用血液透析或连续性静脉 - 静脉血液滤过法,改善患者肾功能受损情况,调节体内水电解质,帮助患者尽快度过少尿期[4,5]。为了对比两种方式对肾综合征出血热合并急性肾功能衰竭的疗效,我院自 2012 年 3 月 -2016 年 3 月选取了 60 例肾综合征出血热合并急性肾功能衰竭的患者,现报道如下。

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1 资料与方法

1.1 病例资料

选取肾综合征出血热合并急性肾功能衰竭的患者 60 例，年限：2012 年 3 月 -2016 年 3 月，均为我院肾内科收治的患者，纳入标准：① 均符合肾综合征出血热合并急性肾功能衰竭的诊断标准[6,7]；② 临床表现为少尿、头痛、身体发热、消化道出血；③ 血清肾综合征出血热特异性 IgM 抗体呈阳性；④ 经本院伦理委员会同意，治疗前患者均签署书面知情同意书。排除标准：原发性高血压、凝血功能障碍、肝肾功能不全患者。按入院单双号将患者分为两组，单号入院患者为观察组(31 例)，其中，男 18 例，女 13 例，平均年龄(67.9± 13.5)岁，采用血液透析的方式治疗肾综合征出血热合并急性肾功能衰竭，双号入院患者为对照组(29 例)，其中，男 17 例，女 12 例，平均年龄(66.7± 12.4)岁，采取连续性静脉 - 静脉血液滤过法治疗肾综合征出血热合并急性肾功能衰竭，两组患者病例资料具有可比性(P>0.05)。

1.2 治疗方法

观察组：行血液透析治疗，所用血液透析机为重庆多泰医用设备有限公司生产，透析面积为 1.4 m^2，碳酸氢盐透析液透析，前两次透析时间为 2-3 h/ 次，后面透析时间维持 4-5 h/ 次，3 次 / 周，血液流量 150-250 mL/min，在据患者输液量、血压、出血情况确定超滤量，低分子肝素钠抗凝。

对照组：采用连续性静脉 - 静脉血液滤过治疗，所用机型为百特 Accura，滤器选择 AV600，每次治疗更换新滤器，不复用，血流量保持 200-250 mL/min，置换液速度为 3-4 L/h，根据患者病情确定超滤量，持续时间 12 h/d，间隔 24 h 后，根据病情行第 2 次治疗。碳酸氢盐置换液采用前稀释方式输入，低分子肝素钠抗凝。

1.3 观察指标

① 观察两组患者钾离子(K^+)、碳酸氢根离子(HCO_3^-)、血尿素氮(BUN)、血清肌酐(Cr)治疗前后的变化；取患者外周静脉血，1000 r/min 离心 15 min，取上清液，-80 ℃保存待测。全自动生化分析仪(贝克曼库尔特，型号：AU480)测量患者体内 K^+、HCO_3^-、BUN、Cr 水平；② 血常规：观察并记录两组患者治疗前后 Hb，Hct，PLT 水平，采用全自动血液分析仪(深圳市凯特生物医疗电子科技有限公司，型号：CT-3180)检测上述指标；③ 生存率：观察并记录两组患者 1 年内生存率情况；④ 不良反应：观察并记录治疗期间，是否有低血压、寒战和心律失常等不良反应。

1.4 统计方法

采用 SPSS 17.0 统计软件分析，数据以 $\bar{x}\pm s$ 表示，组内术前与术后相比采用配对 t 检验，组间比较采用两独立样本 t 检验，计数资料采用卡方检验，以 $P<0.05$ 为差异有统计学意义。

2 结果

2.1 两组肾功能和血清离子变化情况

治疗前两组 K^+、HCO_3^-、BUN、Cr 等指标无统计学差异(P>0.05)，治疗后两组 K^+、BUN、Cr 等指标均明显降低，且观察组上述指标低于对照组(P<0.05)；治疗后两组 HCO_3^- 水平升高，且观察组高于对照组(P<0.05)，见表 1。

表 1 治疗前后肾功能和血清离子变化情况对比

Table 1 Comparison of renal function and serum ion change before and after treatment

		K^+ (mmol/L)	HCO_3^- (mmol/L)	BUN (mmol/L)	Cr (μmol/L)
Observation group	Before treatment	5.7± 0.7	13.4± 5.1	31.7± 9.6	1137± 259
n=31	After treatment	3.9± 0.5*#	23.1± 6.4*#	6.1± 2.3*#	85± 27*#
Control group	Before treatment	5.9± 1.0	14.1± 5.3	32.2± 10.2	1142± 261
n=29	After treatment	4.6± 0.8*	18.6± 4.8*	16.5± 8.9*	167± 36*

Note: compared with the value before treatment, *P<0.05; compared with the control group, #P<0.05.

2.2 两组治疗前后血常规指标比较

治疗前，两组 Hb，Hct，PLT 无统计学差异(P>0.05)，治疗后两组 Hb，Hct，PLT 均升高(P<0.05)，但组间比较没有统计学差异(P>0.05)，见表 2。

表 2 两组血常规指标对比

Table 2 Comparison of blood routine indexes between two groups

Groups		Hb (g/L)	Hct (%)	PLT (× 10^9/L)
Observation group	Before treatment	118.46± 19.42	31.29± 5.78	86.47± 12.61
n=31	After treatment	130.22± 21.67*	35.39± 6.11*	147.14± 36.28*
Control group	Before treatment	117.65± 18.56	31.87± 6.64	85.59± 13.52
n=29	After treatment	131.34± 22.31*	36.11± 6.23*	148.36± 37.39*

Note: compared with the value before treatment, *P<0.05.

2.3 生存情况对比

随访 1 年期间，观察组患者 6 个月生存率 93.5 %，12 个月生存率 87.1 %，均高于对照组患者的生存率(P<0.05)。明显高于对照组(P<0.05)，见表 3。

2.4 不良反应情况对比

治疗期间,观察组患者出现寒战 1 例,轻度低血压 2 例,心律失常 1 例,不良反应率 12.9 %。对照组患者出现寒战 2 例,轻度低血压 3 例,不良反应率 17.2 %,两组不良反应率差异无统计学意义(P>0.05)。

表 3 两组 1 年内生存率对比[n(%)]

Table 3 Comparison of 1 year survival rate between two groups[n(%)]

Groups	n	6 months survival rate	12 months survival rate
Observation group	31	29(93.5) *	27(87.1) *
Control group	29	21(72.4)	18(62.1)

Note: compared with the control group, *P<0.05.

3 讨论

肾综合征出血热是由流行性出血热病毒引起的传染病,一般人群普遍易感,预后体内可产生较强抵抗力[8,9]。患者病发时,以发热、低血压、出血、肾功能损害为临床特征,疾病较危急。该病对肾功能低下的患者影响较大, 容易引起急性肾功能衰竭[10,11]。倘若对该类患者救治不及时,容易引起死亡,故尽早发现尽早治疗可有效改善患者生存率[12-14]。

单纯给予液体等保守治疗措施难以达到满意疗效,不能有效提高患者生存率。有研究表明,采用血液净化治疗能将患者死亡率从 47.8 %降到 16.3 %[15,16]。血液透析是血液净化的一种方式,能通过半透膜原理,治疗肾综合征出血热合并急性肾功能衰竭具有如下优势:① 将流体中对机体有害的代谢物、电解质滤出体外,纠正酸中毒;② 将感染性炎性介质,如肿瘤坏死因子(TNF)、白细胞介素 -1(IL-1)排出体外;③ 起到部分肾功能代偿的作用,为肾脏自我修复提供时间。连续性静脉 - 静脉血液滤过法也是常用的肾综合征出血热合并急性肾功能衰竭的治疗方法之一,具有缓慢、等渗、连续地超滤水分及溶质,对血液中的毒性物质具有较好过滤作用[17,18]。

王国华等[19]采用血液透析治疗肾综合征出血热合并急性肾功能衰竭患者 42 例, 治疗后患者 BUN、Cr 水平较治疗前下降。BUN、Cr 均为反映肾功能的指标,升高则说明出现肾功能损害。因此肾综合征出血热合并急性肾功能衰竭患者常处于少尿期,水电解质紊乱,低钾血症、高钾血症均可出现。故本研究还观察了 K^+,HCO_3^- 治疗前后的变化情况。治疗前两组 K^+、HCO_3^-、BUN、Cr 等指标无统计学差异(P>0.05),治疗后两组 K^+、BUN、Cr 等指标均明显降低, 且观察组上述指标低于对照组(P<0.05); 治疗后两组 HCO_3^- 水平升高, 且观察组高于对照组(P<0.05)。说明血液透析可以更好地调节患者体内水电解质平衡,纠正酸中毒,改善机体内环境和肾功能。刘洪艳等[20]采用血液净化治疗该类患者 128 例,治疗后患者 Hb,Hct,PLT 较透析前有所增高。本研究中,治疗前,两组 Hb,Hct,PLT 无统计学差异(P>0.05),治疗后两组 Hb,Hct,PLT 均升高(P<0.05),但组间比较没有统计学差异(P>0.05),与刘洪艳等研究相仿。由于少尿期液体大量外渗,使血液呈稀释状态,各项血常规指标有所下降,而血液透析和连续性静脉 - 静脉血液滤过法均能较好地调整患者血液状态,使之恢复到正常水平。随访 1 年期间,观察组患者 6 个月生存率 93.5 %,12 个月生存率 87.1 %,均高于对照组患者生存率(P<0.05)。这说明血液透析预后效果较好,患者生存率较高。治疗期间,患者出现了轻度低血压、寒战、心律失常等不良反应。轻度低血压是血液净化常见的不良反应,多与患者在血液净化过程中有效血容量减少有关,间接引起患者出血寒战、心律失常。因此在透析过程中应严密观察病情变化,设定适当的超滤率及透析间期,避免透析过程中低血压的发生。

综上所述,血液透析对肾综合征出血热合并急性肾功能衰竭具有较好的治疗效果,能调节体内电解质平衡,改善肾功能,提高生存率,改善血液状态的效果与连续性静脉 - 静脉血液滤过法相当。

参 考 文 献 (References)

[1] Ku MC, Suh SI, Lee HJ, et al. Hemorrhagic fever with renal syndrome-related encephalopathy: magnetic resonance imaging findings[J]. Clin Imaging, 2015, 39(6): 975-978

[2] Nicolas JB. Acalculous cholecystitis associated with hemorrhagic fever with renal syndrome[J]. Acta Clin Belg, 2015, 70(5): 377-381

[3] Xiao H, Huang R, Gao LD, et al. Effects of Humidity Variation on the Hantavirus Infection and Hemorrhagic Fever with Renal Syndrome Occurrence in Subtropical China [J]. Am J Trop Med Hyg, 2016, 94 (2):420-427

[4] Joob B, Wiwanitkit V. Acalculous cholecystitis and hemorrhagic fever with renal syndrome[J]. Acta Clin Belg, 2015, 70(6): 468

[5] 杨有芹, 杨有京, 常晓东, 等. 不同血液净化方式对慢性肾脏病矿物质和骨异常的疗效观察 [J]. 现代生物医学进展, 2016, 16(3): 526-528
Yang You-qin, Yang You-jing, Chang Xiao-dong, et al. Effect of Different Blood Purification Ways on Mineral and Bone Disorder in Chronic Kidney Disease [J]. Progress in Modern Biomedicine, 2016, 16(3): 526-528

[6] Kuragano T, Yahiro M, Kida A, et al. Effect of protoconized therapy for renal anemia on adverse events of patients with maintenance hemodialysis[J]. Int J Artif Organs, 2015, 37(12): 865-874

[7] Bour A, Reynes JM, Plaisancie X, et al. Seoul hantavirus infection-associated hemorrhagic fever with renal syndrome in France: A case report[J]. Rev Med Interne, 2016, 37(7): 493-496

[8] Isnard P, Labaye J, Bourgault M. An hemorrhagic fever with renal syndrome revealing a leptospirosis [J]. Presse Med, 2015, 44 (3): 349-352

(下转第 4360 页)

ASAIO J, 2016, 62(3): 232-239

[11] Ku ś mierczyk M, Ku ć M, Szyma ń ski J, et al. Pulsatile-flow mechanical circulatory support (MCS) as a bridge to transplantation or recovery. Single-centre experience with the POLCAS system in 2014[J]. Kardiochir Torakochirurgia Pol, 2015, 12(3): 228-232

[12] Zhang JM, Liu XC, Liu ZG, et al. Comparison of effects of extra-thoracic paraaortic counterpulsation to intraaortic balloon pump on circulatory support in acute heart failure [J]. J Cardiothorac Surg, 2015, 24(10): 173-179

[13] Ga ̨sior M, Pyka Ł, Gorol J, et al. ConteMporary Modalities In Treatment of Heart Failure: a report from the COMMIT-HF registry [J]. Kardiol Pol, 2016, 74(6): 523-528

[14] Schwarz B, Abdel-Wahab M, Robinson DR, et al. Predictors of mortality in patients with cardiogenic shock treated with primary percutaneous coronary intervention and intra-aortic balloon counterpulsation [J]. Med Klin Intensivmed Notfmed, 2015, 11(23): 273-278

[15] Khera R, Cram P, Vaughan-Sarrazin M, et al. Use of Mechanical Circulatory Support in Percutaneous Coronary Intervention in the United States[J]. Am J Cardiol, 2016, 117(1): 10-16

[16] Kretzschmar D, Lauten A, Ferrari MW. In vitro evaluation of a novel pulsatile right heart assist device - the PERKAT system[J]. Int J Artif Organs, 2015, 38(10): 537-541

[17] Vondran M, Rastan AJ, Tillmann E, et al. Intra-Aortic Balloon Pump Malposition Reduces Visceral Artery Perfusion in an Acute Animal Model[J]. Artif Organs, 2016, 40(4): 334-340

[18] Takahashi A, Taniguchi N, Mizuguchi Y, et al. Virtual 5-French intra-aortic pumping using a Glidesheath Slender and 6-French intra-aortic balloon catheter[J]. Cardiovasc Revasc Med, 2015, 16(5): 276-279

[19] Vanden Eynden F, Mets G, De Somer F, et al. Is there a place for intra-aortic balloon counterpulsation support in acute right ventricular failure by pressure-overload?[J]. Int J Cardiol, 2015, 15(197): 227-234

[20] Shi C, Zhou DD, Liu G, et al. The left ventricular assist effect and biocompatibility study of a novel para-aortic counterpulsation device [J]. Eur Rev Med Pharmacol Sci, 2015, 19(10): 1859-1865

[21] Schampaert S, van Nunen LX, Pijls NH, et al. Intra-Aortic Balloon Pump Support in the Isolated Beating Porcine Heart in Nonischemic and Ischemic Pump Failure[J]. Artif Organs, 2015, 39(11): 931-938

(上接第 4348 页)

[9] Khaiboullina SF, Martynova EV, Khamidullina ZL, et al. Upregulation of IFN-γ and IL-12 is associated with a milder form of hantavirus hemorrhagic fever with renal syndrome [J]. Eur J Clin Microbiol Infect Dis, 2014, 33(12): 2149-2156

[10] Tervo L, Mäkelä S, Syrjänen J, et al. Smoking is associated with aggravated kidney injury in Puumala hantavirus-induced haemorrhagic fever with renal syndrome[J]. Nephrol Dial Transplant, 2015, 30(10): 1693-1698

[11] Du H, Li J, Yu HT, et al. Early indicators of severity and construction of a risk model for prognosis based upon laboratory parameters in patients with hemorrhagic fever with renal syndrome [J]. Clin Chem Lab Med, 2014, 52(11): 1667-1675

[12] Noh JY, Cheong HJ, Song JY, et al. Clinical and molecular epidemiological features of hemorrhagic fever with renal syndrome in Korea over a 10-year period[J]. J Clin Virol, 2013, 58(1): 11-17

[13] Xiao D, Wu K, Tan X, et al. The impact of the vaccination program for hemorrhagic fever with renal syndrome in Hu County, China[J]. Vaccine, 2014, 32(6): 740-745

[14] Ardalan M, Chinikar S, Mohajel Shoja M. Hemorrhagic Fever with renal syndrome and its history in Iran [J]. Iran J Kidney Dis, 2014, 8 (6): 438-442

[15] Zhu N, Luo F, Chen Q, et al. Influence of HLA-DRB alleles on haemorrhagic fever with renal syndrome in a Chinese Han population in Hubei Province, China [J]. Eur J Clin Microbiol Infect Dis, 2015, 34(1): 187-195

[16] Lin H, Zhang Z, Lu L, et al. Meteorological factors are associated with hemorrhagic fever with renal syndrome in Jiaonan County, China, 2006-2011[J]. Int J Biometeorol, 2014, 58(6): 1031-1037

[17] Connolly-Andersen AM, Hammargren E, Whitaker H, et al. Increased risk of acute myocardial infarction and stroke during hemorrhagic fever with renal syndrome: a self-controlled case series study [J]. Circulation, 2014, 129(12): 1295-1302

[18] Li S, Ren H, Hu W, et al. Spatiotemporal heterogeneity analysis of hemorrhagic fever with renal syndrome in China using geographically weighted regression models[J]. Int J Environ Res Public Health, 2014, 11(12): 12129-12147

[19] 王国华. 血液净化对肾综合征出血热急性肾功能衰竭的治疗效果观察[J].中国医药指南, 2013, 11(7): 213-214
Wang Guo-hua. The therapeutic effect of blood purification on hemorrhagic fever with renal syndrome in patients with acute renal failure[J]. Guide of China Medicine, 2013, 11(7): 213-214

[20] 刘洪艳, 许春, 王凯, 等. 血液净化治疗肾综合征出血热合并急性肾功能衰竭 128 例临床分析 [J]. 热带医学杂志, 2010, 10(8): 959-960
Liu Hong-yan, Xu Chun, Wang Kai, et al. Analysis of Function of Hemodialysis in Treating 128 HFRS Patients Accompanied with ARF [J]. Journal of Tropical Medicine, 2010, 10(8): 959-960