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轮状病毒感染性腹泻患儿血清CRP、心肌酶谱、肝功能的检测意义

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摘要 目的：探究轮状病毒感染性腹泻患儿血清C反应蛋白（CRP）、心肌酶谱、肝功能指标的检测意义。**方法：**选择2014年1月～2016年5月我院收治的110例轮状病毒感染致腹泻患儿及同期收治的85例细菌感染性腹泻患儿为研究对象，另外选择20名同期于我院体检的年龄、性别相匹配的健康幼儿为对照。比较三组人群血清C反应蛋白、白介素6、肌钙蛋白(hs-cTnT)、肌酸激酶(CK)、同工酶(CL-MB)、门冬氨酸氨基转移酶(AST)、丙氨酸氨基转移酶(ALT)水平的差异及轮状病毒感染致腹泻患儿外损伤的发生情况。**结果：**轮状病毒感染(RV)组患儿下呼吸道感染、皮疹、心肌损伤以及肝功能损伤的发生率均显著高于细菌感染组($P<0.05$)；RV组和细菌感染组组患儿的血清CRP、IL-6水平均显著高于健康对照组，RV组患儿的上述指标显著低于细菌感染组($P<0.05$)；RV组患者肌钙蛋白(hs-cTnT)、肌酸激酶(CK)、同工酶(CL-MB)、门冬氨酸氨基转移酶(AST)、丙氨酸氨基转移酶(ALT)水平均显著高于细菌感染组及健康对照组患儿($P<0.05$)，细菌感染组患儿上述指标与健康对照组比较，差异无统计学意义($P>0.05$)。**结论：**血清CRP、心肌酶谱、肝功能指标联合检测对于早期轮状病毒感染性腹泻与细菌感染性腹泻的鉴别诊断有一定的参考价值。

关键词：轮状病毒；腹泻；细菌感染；C反应蛋白；心肌酶谱；肝功能

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The Significance of Detecting Serum CRP, Myocardial Enzymes, Liver Function Index in Pediatric Patients with Rotavirus Infectious Diarrhea

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ABSTRACT Objective: To explore the significance of detecting serum CRP, myocardial enzymes, liver function index in pediatric patients with rotavirus infectious diarrhea. **Methods:** 110 pediatric patients with rotavirus infectious diarrhea and 85 age-matched patients with bacterial infectious diarrhea who were both treated in our hospital from January, 2014 to May, 2016 were enrolled in the present study. Another 20 healthy patients who had physical examination in our hospital were considered as control group. The differences of serum CRP, IL-6, hs-cTnT, CK, CL-MB, AST, ALT level and the incidence of parenteral injury were compared. **Results:** The incidence rate of lower respiratory tract infectivity, rash, myocardial damage and hepatic injury in RV group were significantly lower than the bacterial infectious group ($P<0.05$), the level of serum CRP, IL-6 in RV group and bacterial infectious group were significantly higher than the control group, and those of RV group were significantly lower than bacterial infectious group ($P<0.05$); the level of hs-cTnT, CK, CL-MB, AST, ALT in RV group were significantly higher than bacterial infectious group and control group ($P<0.05$), and those indexes of bacterial infectious group were no significantly differences compared with healthy control ($P>0.05$). **Conclusion:** The combined detection of serum CRP, myocardial enzyme and liver function indexes were of certain significance in the early distinguishing diagnosis of bacterial infectious diarrhea from rotavirus infectious diarrhea.

Key words: Rotavirus; Diarrhea; Bacterial infection; CRP; Myocardial enzymes, Liver function

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前言

轮状病毒(RV)是一种双链核糖核酸病毒，共分为7个种类(A、B、C、D、E、F、G)，A种是人类轮状病毒感染的主要类型。轮状病毒主要经粪-口途径传播，是引起婴幼儿腹泻的主要病原体之一[1]。全世界每年约有90万名婴幼儿死于轮状病毒感染，我国每年大约有25%的婴幼儿患轮状病毒感染性胃肠炎[2]。近年来，除腹泻之外，由轮状病毒引发的肠道外损伤如心肌炎、肝功能损害、中枢神经系统损害等日益受到关注[3-5]。血清学指标检测方便，且其变化与病情严重程度、预后等密切相关，临床上常用来辅助判断病情。本研究检测了2014年1月～2016年5月于我院就诊的轮状病毒感染致腹泻患儿的血清C反应蛋白、心肌酶、肝功能指标的水平，旨在为反映病情严重程度及轮状病毒致肠道外损伤提供临床数据。

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1 资料与方法

1.1 一般资料

选择 2014 年 1 月～2016 年 5 月我院收治的 110 例轮状病毒感染致腹泻患儿及同期收治的 85 例非轮状病毒感染性腹泻患儿为研究对象。轮状病毒感染组(RV)患儿 RV 抗原检测均显示阳性，且不存在致病菌交叉感染，包括男性 63 名，女性 47 名；平均年龄(14.46± 5.5)个月；细菌感染性腹泻组(非 RV)患儿 RV 抗原检测均显示阴性，包括男性 49 名，女性 36 名；平均年龄(15.03± 4.7)岁；两组临床资料比较，差异无统计学意义(P＞0.05)。纳入标准：① 轮状病毒感染组患儿符合《儿科学》[6]中相关诊断标准；② 所有患儿病例资料完整，家属签署知情同意书，该研究获得我院伦理委员会批准。排除标准：① 合并先天性心脏病；② 合并其他脏器功能不全；另外选择 20 名同期于我院体检的年龄、性别相匹配的健康幼儿为对照。

1.2 检测指标

采集入组患儿空腹静脉血 5.0 mL，经静置离心处理后获得血清；正常体检幼儿体检时血液标本经相同处理获得血清，血清分装，存于 -80℃冰箱备用。用全自动生化分析仪检测血清中 C 反应蛋白、白介素 6、肌钙蛋白(hs-cTnT)、肌酸激酶(CK)、同工酶(CL-MB)、门冬氨酸氨基转移酶(AST)、丙氨酸氨基转移酶(ALT)。

1.3 判定标准

CK-MB 大于 25 U/L 认为心肌损伤；肝损伤判定标准为：ALT 超过 40 U/L。

1.4 统计学分析

使用 SPSS18.0 软件，计数资料采用卡方检验，计量资料采用方差分析进行统计学检验，两两比较采用 SNK-q 法，以 P<0.05 为差异有统计学意义。

2 结果

2.1 两组患儿肠道外损伤的发生情况比较

两组患儿均存在肠道外损伤情况，包括下呼吸道感染、惊厥、皮疹、心肌损伤以及肝功能损伤。RV 组患儿下呼吸道感染、皮疹、心肌损伤以及肝功能损伤的发生率均显著高于细菌感染性腹泻组(P＜0.05)。

表 1 两组患儿肠道外损伤发生情况比较(n(%))

Table 1 Comparison of the incidence of extraintestinal damage between the two groups (n (%))

Groups	Number	LRT	Convulsion	Rash	Myocardial damage	Hepatic injury
Rotavirus group	110	34(30.91)[a]	8(7.27)	14(12.73)[a]	58(52.73)[a]	36(32.73)[a]
Bacterial infection group	85	8(9.41)	6(7.06)	3(3.53)	16(18.8)	15(17.65)

Note: compared with Bacterial infection group, [a]P<0.05; LRT refers to Lower respiratory infection.

2.2 三组血清 CRP、IL-6 水平比较

RV 组和细菌感染组患儿的血清 CRP、IL-6 水平均显著高于健康对照组，RV 组患儿的上述指标显著低于细菌感染组(P＜0.05)。

表 2 三组患儿血清 CRP、IL-6 水平比较($\bar{x}$± s)

Table 2 Comparison of the levels of serum CRP, IL-6 among the three groups($\bar{x}$± s)

Groups	Number	CRP(mg/L)	IL-6(pg/mL)
Rotavirus group	110	11.30± 8.71[ab]	11.22± 7.63[ab]
Bacterial infection group	85	24.26± 15.31[a]	33.69± 14.11[a]
Healthy control group	20	4.25± 3.12	3.27± 2.42

Note: compared with healthy control group, [a]P<0.05; compared with bacterial infection group, [b]P<0.05.

2.3 三组心肌酶、肝功能水平比较

RV 组患者心肌酶谱(肌钙蛋白(hs-cTnT)、肌酸激酶(CK)、同工酶(CL-MB))及肝功能指标(门冬氨酸氨基转移酶(AST)、丙氨酸氨基转移酶(ALT)水平)均显著高于细菌感染组及健康对照组患儿(P＜0.05)。

表 3 三组心肌酶、肝功能水平比较($\bar{x}$± s)

Table 3 Comparison of the levels of myocardial enzyme, liver function among the three groups ($\bar{x}$± s)

Groups	Number	Myocardial enzymes			Liver function	
		hs-cTnT(ng/L)	CK(U/L)	CK-MB(U/L)	AST(U/L)	ALT(U/L)
Rotavirus group	110	22.36± 4.22[a]	308.21± 45.23[a]	35.47± 5.31[a]	52.18± 4.52[a]	46.39± 3.29[a]
Bacterial infection group	85	8.06± 1.26	143.39± 25.21	19.84± 3.12	24.67± 3.33	25.77± 4.17
Healthy control	20	7.73± 1.10	138.42± 27.13	18.22± 3.29	22.59± 6.33	22.36± 2.98

Note: compared with healthy control group, [a]P<0.05.

3 讨论

小儿腹泻是婴幼儿时期常见的肠道疾病，其发病率高且具有传染性，严重威胁幼儿身体健康。婴幼儿肠胃系统、免疫系统功能发育不完善，加之肠道正常菌群未完全建立，一旦受到病原菌入侵，极易引发感染，并导致腹泻[7,8]。病毒与细菌是主要的

两大致病微生物，抗生素是治疗细菌感染性腹泻的有效手段，但对于轮状病毒感染性腹泻的疗效甚微[9,10]。因此，早期的甄别诊断对于后续临床用药具有指导性意义。

病毒性感染一般不会引起炎症反应，然而病毒感染时抵抗力下降，此时易并发细菌感染而导致炎症。本研究结果显示轮状病毒感染性腹泻患儿与细菌感染组患儿血清炎症因子水平(CRP、IL-6)均显著高于正常对照组，然而细菌感染组的上述指标明显高于轮状病毒感染组。因此，CRP 与 IL-6 可作为继发性细菌感染的检测指标，提示应联合抗生素治疗[11,12]。褚邦勇等人的研究亦证实 CRP 和 IL-6 检测在细菌性和病毒性腹泻患者的鉴别诊断中具有良好的效力，CRP 检测操作简单且可重复性更优，与本文研究结果一致[13]。轮状病毒靶向作用于小肠上皮细胞，损害胃肠屏障儿进入血液，进而引起多种肠道外损害[14,15]，本研究亦证实轮状病毒感染性腹泻患儿并发下呼吸道感染、心肌炎、肝功能损伤等肠道外损伤的发生率显著高于细菌感染性腹泻患儿。由于早期心肌损害的临床症状不明显，且幼儿表达能力有限，容易被家长和医生忽视。心肌酶谱是评价心肌损伤的一个综合指标，包括肌钙蛋白(hs-cTnT)、肌酸激酶(CK)及同工酶(CL-MB)，其中 hs-cTnT 是判断心肌损伤最灵敏且具有高特异性的指标，当心肌损伤 2 h 后，可在血液中检测到心肌肌钙蛋白复合物含量升高[16,17]。门冬氨酸氨基转移酶(AST)在心脏和心肌细胞均有高表达，丙氨酸氨基转移酶(ALT)主要来源于肝脏，其表达量与肝细胞受损程度呈正比，可作为肝损伤灵敏且特异的指标[18,19]。本研究结果显示轮状病毒感染组患儿的心肌酶及肝功能指标均显著高于细菌感染组及正常对照组幼儿，细菌感染组患儿上述指标与正常组无明显差异，该结果表明心肌酶与肝功能检测可辅助判别轮状病毒感染性腹泻患儿与细菌感染性腹泻患儿，且对于轮状病毒早期肠道外损伤有一定的提示作用，与文义[20]、熊金凤[21]等人的报道一致。

综上所述，细菌性感染与轮状病毒感染所致腹泻患儿在血清 CRP、心肌酶谱、肝功能指标上存在显著差异，提示上述指标联合检测对于早期轮状病毒感染性腹泻与细菌感染性腹泻有一定的鉴别意义，一定程度上能够为早期临床干预提供依据。

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