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小儿消化性疾病的胃电图变化及与临床特点和胃镜特征的关联性*

蔡洁 袁丽萍 桂明 胡波 周其莲

(安徽医科大学第一附属医院儿科 安徽 合肥 230022)

摘要 目的:分析小儿消化性疾病的胃电图变化及与临床病理特征和胃镜特征的关联性。**方法:**选取2018年1月至2019年5月我院儿科收治的经胃镜和病理学两种方式诊断为消化性疾病的患儿54例为观察组,另选取无胃肠道疾病的健康儿童40例为对照组。比较两组胃电图参数(频率均值和波幅均值),54例胃电图诊断后纤维胃镜检查结果,分析消化性患儿HP感染与临床病理特征、溃疡面积的关系。**结果:**各组胃病患者胃电慢波频率均值各不相同($P<0.05$),三组患者胃电慢波波幅均值相比差异具有统计学意义($P<0.05$);且浅表性胃炎组、胆汁反流性胃炎组患者胃电慢波频率均值、胃电慢波波幅均显著低于胃溃疡组($P<0.05$);浅表性胃炎组患者胃电慢波频率均值显著低于胆汁反流性胃炎组($P<0.05$)。胆汁反流性胃炎组患者胃电慢波波幅显著低于浅表性胃炎组($P<0.05$)。胃镜检查结果显示,其中浅表性胃炎的诊断符合率较高,达90.00%,胃溃疡符合率为60.71%,胆汁反流性胃炎符合率为83.33%。HP检测结果显示,HP阳性患儿占总例数的77.78%(42/54),HP阴性患儿占总例数的22.22%(12/54);HP阳性组患儿淋巴滤泡形成、胃黏膜萎缩、胃黏膜炎症活动的发生率明显高于HP阴性组,差异具有统计学意义($P<0.01$);HP阳性组溃疡范围 >2 cm的患儿比例明显高于HP阴性患儿,差异具有统计学意义($P<0.01$)。**结论:**小儿消化性疾病胃电图存在餐后NSWP的下降及节律过缓的上升,胃电图检查和胃镜检查在诊断上有较高的符合率,HP感染引起胃黏膜组织学改变,可作为小儿消化性疾病的靶向治疗。

关键词:小儿消化性疾病;胃电图;临床特点;胃镜

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Changes of Electrogastrogram in Children with Peptic Ulcer and Its Correlation with Clinical and Endoscopic Features*

CAI Jie, YUAN Li-ping, GUI Ming, HU Bo, ZHOU Qi-lian

(The First Affiliated Hospital of Anhui Medical University, Department of Pediatrics, Hefei, Anhui, 230022, China)

ABSTRACT Objective: To analyze the changes of electrogastrogram in children with peptic gastric ulcer and its correlation with clinicopathological and gastroscopic features. **Methods:** 54 children with peptic ulcer diagnosed by gastroscopy and pathology in our pediatrics department from January 2018 to May 2019 were selected as observation group, and 40 healthy children without gastrointestinal diseases were selected as control group. The parameters of electrogastrogram (mean frequency and mean amplitude) and the results of fiberoptic gastroscopy in 48 children with peptic ulcer were compared. The relationship between HP infection and clinicopathological features and ulcer area was analyzed. **Results:** The mean frequencies of gastric slow wave were different in each group ($P<0.05$), and the mean amplitudes of gastric slow wave in the three groups were significantly different ($P<0.05$). The mean frequency and the mean amplitude of gastric electrical slow wave were significantly lower in the superficial gastritis group and the bile reflux gastritis group than in the gastric ulcer group ($P<0.05$). The mean frequency of gastric electrical slow wave in the superficial gastritis group was significantly lower than that in the bile reflux gastritis group ($P<0.05$). The amplitude of gastric electrical slow wave was significantly lower in the bile reflux gastritis group than in the superficial gastritis group ($P<0.05$). The results of gastroscopy showed that the diagnostic coincidence rate of superficial gastritis was 90.00%, gastric ulcer was 60.71%, and bile reflux gastritis was 83.33%. The results of HP test showed that 77.78% (42/54) of the total cases were HP-positive and 22.22% (12/54) were HP-negative. The incidence of lymphatic follicle formation, atrophy of gastric mucosa and inflammatory activity of gastric mucosa in HP-positive group was significantly higher than that in HP-negative group ($P<0.01$), and the proportion of children with ulcer range >2 cm in HP-positive group was significantly higher than that in HP-negative group ($P<0.01$). The difference was statistically significant ($P<0.01$). **Conclusion:** Postprandial NSWP decrease and slow rhythm increase exist in electrogastrogram of peptic ulcer in children. The coincidence rate of electrogastrogram and gastroscopy in diagnosis is high. The histological changes of gastric mucosa caused by HP infection department can be used as targeted therapy for peptic ulcer in children.

Key words: Peptic gastric ulcer in children; Electrogastrogram; Clinical characteristics; Gastroscopy

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作者简介:蔡洁(1983-),女,硕士,主治医师,主要研究方向:儿童消化系统疾病,电话:13865935140

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前言

消化性溃疡是指发生在胃和十二指肠接触消化液的黏膜及其深层组织一种局限性黏膜缺陷,亦可发生于食管下段、胃肠吻合口、小肠等处,其形成与胃酸和胃蛋白酶的消化有关,胃排空延缓和胆汁反流、遗传及药物等因素也和消化性溃疡的发生有关^[1,2]。该病好发于青壮年,儿童亦可发病。近年来,随着消化内镜在儿科的普及应用,小儿消化性溃疡的检出率明显上升,已成为儿科常见的消化系统疾病。但不同年龄的患儿症状差异较大,主要表现为慢性腹痛,常规超声或X射线等影像学检查诊断对患儿病情有一定局限性,容易导致误诊或漏诊^[3,4]。

胃电图是采用体表电极经人体腹壁体表记录胃电活动,通过肌电活动与机械活动的关系检查胃功能,因其具有无痛无创的特点备受临床工作者的关注,可作为胃功能活动的客观生物电学指标^[5,6]。近年来,随着科技的不断发展,电子胃镜下可有效观察消化性溃疡患儿的胃部血流图,为临床诊断和治疗提供很大的帮助^[7]。目前,人们普遍认为幽门螺杆菌(*Helicobacter pylori*, HP)与消化性溃疡的发生密切相关,也是小儿消化性溃疡常见的致病因素^[8,9]。HP感染可导致胃酸分泌的改变,进而导致胃黏膜保护因子和攻击因子平衡的紊乱,在胃酸和胃蛋白酶的共同作用下导致消化性溃疡的形成,对儿童的生长发育带来严重影响^[10,11]。因此,本研究对小儿消化性疾病的胃电图变化进行分析,旨在探讨患儿临床特点和胃镜特征的关联性。

1 资料与方法

1.1 研究对象

选取2018年8月至2019年5月我院儿科收治的经胃镜检查 and 病理学检查确诊为消化性疾病的患儿54例为观察组,入组标准:①符合小儿胃炎、胃溃疡的胃镜判断标准^[12];②年龄1~14岁;③无出血、穿孔、幽门梗阻等并发症;④无胃、十二指肠手术史者;⑤患儿家属知情同意并配合治疗,本研究经医院伦理委员会批准进行。排除标准:①先天性消化道发育不全者;②合并严重肝肾功能不全者;③严重腹部外伤者;④合并全身免疫系统疾病或感染症状者;⑤排除血液系统疾病者。其中,男30例,女24例,年龄6~12岁,平均(9.27±2.74)岁,病程1~6个月,平均(3.24±0.48)个月,其中浅表性胃炎20例,胃溃疡28例,胆汁反流性胃炎6例。另选取无胃肠道疾病的健康儿童40例为对照组,男女各20例,年龄6~13岁,平均(9.89±2.02)岁。两组性别、年龄等一般资料比较均无统计学差异($P>0.05$),具有可比性。

1.2 方法

1.2.1 胃电图检查 采用合肥凯利光电科技有限公司的EGEG-8D型八导胃肠电图仪,由固定的检测仪器和操作人员,患儿检查前7d停止使用胃肠动力药,上午空腹6~12h进行检查,患儿取仰卧位,用75%的酒精和盐水清洗皮肤,电极放置胃窦部及胃部对应的投影区,胃窦检测电极位于剑突与脐连线中点处,胃体检测电极位于其左上方45°角处,参考电极位于左手腕内侧,接地电极位于左踝内侧,标准电压150mV/10mm,走纸速度1mm/s。饭前空腹记录6min胃电图,后进食100g面包,10min后记录餐后胃电图。

1.2.2 胃镜检查 选用日本PENTAX和EPK-1000型电子胃镜。54例儿童其中有48例给予胃镜检查,检查前至少禁食禁水6h以上,采取左侧卧姿,术前10min给予局部咽部5~10mL利多卡因胶浆麻醉,内窥镜经口咽进入十二指肠降段,边进镜边检查。观察异常病变周围、颜色和形态特征,病变严重者取胃窦黏膜组织活检,胃镜检查完成后2h后进食半流质食品。

1.2.3 HP检测 采用尿素呼气试验和血清检验还有快速尿素酶检测检测患儿是否有HP阳性感染。所有患儿检查前至少禁食4h以上,用药前取下底部气囊的盖子,患儿吹气充满气袋后关闭盖子,口服一粒尿素^[13C]胶囊,30min后取下样品袋的盖子,把气袋放在嘴里,呼气装满气袋,拧紧盖子。采用^{13C}红外光谱法对底部气袋和样品袋进行检测,($\geq 4.0 \pm 0.4$)时HP为阳性。

1.3 统计学分析

采用SPSS19.0对数据进行统计分析,各组计量数据采用($\bar{x} \pm s$)表示,组间比较采用独立样本t检验,各组计数资料以[n(%)]表示,组间比较采用 χ^2 检验,以 $P<0.05$ 为差异有统计学意义。

2 结果

2.1 消化性疾病患儿胃电参数分析

各组消化性疾病患者胃电慢波频率均值各不相同,。三组患者胃电慢波波幅均值相比差异具有统计学意义($P<0.05$),且浅表性胃炎组、胆汁反流性胃炎组患者胃电慢波频率均值、胃电慢波波幅均显著低于胃溃疡组($P<0.05$);浅表性胃炎组患者胃电慢波频率均值显著低于胆汁反流性胃炎组($P<0.05$)。胆汁反流性胃炎组患者胃电慢波波幅显著低于浅表性胃炎组($P<0.05$)。见表1。

2.2 胃电图诊断后纤维胃镜检查结果

胃镜诊断浅表性胃炎的诊断符合率较高,达90.00%,胃溃疡符合率为60.71%,胆汁反流性胃炎符合率为83.33%,见表2。

表1 54例消化性溃疡的胃电参数分析($\bar{x} \pm s$)

Table 1 Analysis of the electrogastric parameters of 54 cases of peptic ulcer($\bar{x} \pm s$)

Groups	n	Frequency (n/min)	Amplitude(μ V)
Superficial gastritis	20	2.93±0.24*	93.67±4.01*
Gastric ulcer	28	3.36±0.21	197.29±123.03
Bile reflux gastritis	6	3.15±0.22*#	75.58±8.16*#

Note: * compared with gastric ulcer patients, $P<0.05$; # compared with superficial gastritis patients, $P<0.05$.

表 2 胃电图诊断后纤维胃镜检查结果

Table 2 Results of fiberoptic gastroscopy after electrogastrogram diagnosis

Groups	Electrogastrogram	Gastroscope	Coincidence rate(%)
Superficial gastritis	20	18	90.00%
Gastric ulcer	28	17	60.71%
Bile reflux gastritis	6	5	83.33%

2.3 消化性溃疡患儿 HP 感染与临床病理特征的关系

HP 检测结果显示:HP 阳性患儿占总例数的 77.78% (42/54),HP 阴性患儿占总例数的 22.22%(12/54)。HP 阳性组患

儿淋巴滤泡形成、胃黏膜萎缩、胃黏膜炎性活动的发生率明显高于 HP 阴性组($P<0.01$)。见表 3。

表 3 消化性溃疡患儿 HP 感染与临床病理特征的关系[n(%)]

Table 3 The relationship between HP infection and clinicopathological features of children with peptic ulcer[n(%)]

Groups	n	Lymphoid follicle	Gastric atrophy	Inflammatory activity of gastric mucosa
HP positive	42	14(33.33)	20(47.62)	23(54.76)
HP negative	12	2(16.67)	2(16.67)	1(8.33)
χ^2		10.565	14.139	9.347
P		<0.001	<0.001	<0.001

2.4 消化性溃疡患儿 HP 感染与溃疡范围的关系

HP 阳性组溃疡范围 >2 cm 的患儿比例明显高于 HP 阴性

患儿($P<0.01$),见表 4。

表 4 消化性溃疡患儿 HP 感染与溃疡范围的关系[n(%)]

Table 4 Relationship between HP infection and ulcer extent in children with peptic ulcer

Groups	n	>2 cm	1~2 cm	<1 cm
HP positive	42	10(23.80)	11(26.19)	21(50.00)
HP negative	12	8(66.67)	3(25.00)	1(8.33)
χ^2			7.714	
P			0.005	

3 讨论

消化性溃疡为儿科常见的消化系统疾病,其症状随患儿的年龄的不同变异较大,临床表现无定型^[13,14]。其中,新生儿多为应激性溃疡,起病多急骤,主要以突发性上呼吸道出血或穿孔为特征;婴幼儿期患儿多以急性起病,往往表现食欲减退^[15,16],发育不良或消瘦;年长儿临床表现与成人相似,症状以上腹痛、脐周疼痛为主,可间歇发生,极少数有持续性疼痛,对患儿身心健康带来严重影响^[17,18]。

消化性溃疡的定义源于其发病机制与胃酸和胃蛋白酶的自身消化有关,胃溃疡的发生与胃黏膜防御机制的减弱有关^[19,20]。胃蛋白酶原可在胃酸的刺激下转化为活性胃泌素,并分解胃粘液中的糖蛋白,破坏胃粘膜屏障,胃蛋白酶在溃疡形成中起着重要作用^[21]。一般 3 岁以下婴儿的胃酸分泌水平较低,随着年龄的增加胃酸和胃蛋白酶分泌水平逐渐升高,因此十二指肠溃疡的发病率逐渐增加^[22,23]。随着胃电图胃镜等临床检查在消化性疾病的应用,小儿消化性溃疡的检出率不断提高。

胃电图是一种测量胃肌电活动的非创伤性方法,临床主要

用于判断胃节律紊乱在胃运动障碍性疾病中的作用^[24]。本研究通过对消化性溃疡患儿胃电图参数进行分析得出各组消化性疾病患者胃电慢波频率及幅值各不相同,与临床诸多为肠疾病胃电图的变化相似^[25,26]。本研究结果显示浅表性胃炎的诊断符合率较高,达 90.00%,胃溃疡符合率为 60.71%,胆汁反流性胃炎符合率为 83.33%,提示胃电图对诊断消化性溃疡最为新型无创伤性检查方法具有一定的临床应用价值。

HP 感染是消化性溃疡病的主要病因,流行病学显示 70% 的胃溃疡和 95% 的十二指肠溃疡与 HP 感染有关^[27,28]。HP 感染不仅可造成儿童发生消化道溃疡和炎症,还可影响患儿生长发育。目前,关于 HP 导致消化性溃疡的致病机制包括 HP 可通过定植于十二指肠内胃化生上皮,产生大量毒素并介导炎症因子的产生,损伤胃黏膜导致溃疡的形成;HP 感染科导致生长抑素和胃泌素调节失调,甚至引起萎缩性胃炎诱发酸分泌减少,引起肠化生和胃黏膜萎缩^[29,30]。本研究通过分析 HP 阳性和 HP 阴性患儿与临床病理特征、溃疡面积的关系,发现 HP 阳性患儿占比更高,患儿淋巴滤泡形成、胃黏膜萎缩、胃黏膜炎性活动的发生率也明显高于 HP 阴性组,且 HP 阳性组溃疡范围 >2 cm

的患儿比例明显高于 *HP* 阴性患儿。这提示 *HP* 感染与消化性溃疡的发生发展密切相关。

综上所述, 小儿消化性疾病胃电图存在餐后 NSWP 的下降及节律过缓的上升, 胃电图检查和胃镜检查在诊断上有较高的符合率, *HP* 感染可引起胃黏膜组织学改变, 可作为小儿消化性疾病的治疗靶点。

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