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消化性溃疡患者血清α防御素，visfatin，IL–17的表达及意义

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[摘　要]　**目的：**分析消化性溃疡患者血清α防御素(alpha defensin，DEFA)、内脂素(visfatin)，IL-17的表达及意义。**方法：**选择重庆市长寿区人民医院2016年3月至2018年3月收治的102例消化性溃疡患者，按疾病类型、幽门螺杆菌(*helicobacter pylori*，*Hp*)情况、病情程度分为不同组别，并同期选择95例健康体检者做为对照组。比较各组血清DEFA，visfatin，IL-17水平，并分析其相关性和诊断效能。**结果：**消化性溃疡组血清DEFA水平低于对照组，血清visfatin，IL-17水平高于对照组(P<0.05)。复合性溃疡组血清DEFA水平低于胃溃疡组及十二指肠溃疡组，血清visfatin，IL-17水平高于胃溃疡组及十二指肠溃疡组(P<0.05)。消化性溃疡*Hp*阴性组血清DEFA水平高于HP I型组及HP II型组(P<0.05)；血清visfatin，IL-17水平高于HP高型组及HP及型组(P<0.05)。消化性溃疡患者活动期血清DEFA低于愈合期且低于疤痕期，visfatin，IL-17水平高于愈合期且高于疤痕期(P<0.05)。消化性溃疡患者血清DEFA和visfatin呈负相关，DEFA和IL-17呈负相关(r分别为−0.526，−0.654)，visfatin和IL-17呈正相关(r为0.404)。受试者工作特征(receiver-operating characteristic，ROC)曲线显示：血清DEFA水平诊断曲线下面积(area under curve，AUC)为0.756，visfatin水平诊断AUC为0.652，IL-17水平诊断AUC为0.830，DEFA+visfatin+IL-17水平诊断AUC为0.892。**结论：**DEFA，visfatin及IL-17均可参与消化性溃疡发病，其水平改变可能和炎症程度有关，可作为临床重要的观察指标。

[关键词]　消化性溃疡；α防御素；内脂素；白介素-17；表达

Expression and significance of serum DEFA, visfatin and IL-17 in patients with peptic ulcer

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Abstract　**Objective:** To analyze the expression and significance of serum alpha defensin (DEFA), visfatin and interleukin-17 (IL-17) in patients with peptic ulcer. **Methods:** One hundred and two patients with peptic ulcer patients who treated from March 2016 to March 2018 in People's Hospital of Chongqing Changshou, according to the disease type, *helicobacter pylori* (*Hp*) situation, disease degree were divided into different groups, at the same time, 95 healthy subjects were selected as the control group. Serum DEFA, visfatin and IL-17 levels of each group were compared, the correlation and diagnostic efficiency were also analyzed. **Results:** Serum levels of DEFA in the

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peptic ulcer group were lower than those in the control group, while the serum levels of visfatin and IL-17 were higher than those in the control group (P<0.05). Serum levels of DEFA in compound ulcer group were lower than those of gastric ulcer group and duodenal ulcer group, while the serum levels of visfatin and IL-17 were higher than those of gastric ulcer group and duodenal ulcer group (P<0.05). Serum levels of DEFA in peptic ulcer *Hp* negative group were higher than HP I group and HP II group (P<0.05), the level of serum visfatin, IL-17 were higher than HP those of gastric ulcer (P<0.05). Serum levels of DEFA in active stage of patients with peptic ulcer was lower than healing stage and lower than scar stage, levels of visfatin and IL-17 were higher than healing stage and higher than scar stage (P<0.05). Serum DEFA and visfatin were negatively correlated in patients with peptic ulcer, while DEFA and IL-17 were negatively correlated (r was −0.526 and −0.654), and visfatin and IL-17 were positively correlated (r was 0.404). Receiver-operating characteristic (ROC) curve drawing, serum level of DEFA diagnosis area under curve (AUC) was 0.756, visfatin level in the diagnosis of AUC was 0.652, IL-17 AUC was 0.830, DEFA + visfatin + IL-17 visfatin level diagnosis was 0.892. **Conclusion:** DEFA, visfatin and IL-17 can all be involved in the incidence of peptic ulcer, Changes in their levels may be related to the degree of inflammation, can be used as an important clinical observation.

Keywords peptic ulcer; alpha defensin; visfatin; interleukin-17; express

消化性溃疡是一种发生于十二指肠与胃部的慢性溃疡，其病情迁延，可引起反复发作的上腹疼痛及程度不一的呕吐、恶心、嗳气等胃肠道症状，明显影响患者身心健康[1]。近年来研究[2]发现消化性溃疡的发病率呈上升趋势，引起国内外广泛关注，但其病因及发病机制尚未完全明确。目前有研究[3]认为多种因素可导致胃肠道黏膜损伤，激活机体免疫系统，引起炎症细胞活化，并分泌炎性细胞因子，从而使胃肠黏膜组织发生炎症反应。α防御素(alpha defensin，DEFA)作为一种多肽，可杀灭病毒、细菌等微生物，参与细胞免疫反应，又可调节机体炎症反应，但目前国内关于其在消化性溃疡中的报道极少[4]。内脂素(visfatin)为近年来新型研发的脂肪细胞因子，参与机体多种炎症性病变[5]。IL-17是来自于T细胞的促炎性因子，可诱导中性粒细胞发育成熟，于炎症反应中起到主要的调控作用[6]。本研究旨在分析消化性溃疡患者血清DEFA，visfatin，IL-17的表达及意义，为其治疗提供理论依据。

1 对象与方法

1.1 对象

选择重庆市长寿区人民医院2016年3月至2018年3月收治的102例消化性溃疡患者，入选标准：符合消化性溃疡诊断标准[7]；伴反复发作且呈节律性的上腹疼痛，上腹部可见局限性的压痛，内镜检测提示存在活动性溃疡，X线钡餐造影提示溃疡龛影；心、肝、肾等器官未见明显病变；近期未接受免疫抑制剂治疗。排除标准：合并出血、幽门梗阻等并发症；胃泌素瘤、肝硬化等所致胃溃疡；自身免疫性病变；哺乳或者妊娠阶段。男56例，女46例；年龄22~71(42.14±2.14)岁。包含34例胃溃疡、53例十二指肠溃疡及15例复合性溃疡；28例幽门螺杆菌(*Hp*)阴性、55例HP I型，19例HP II型；50例活动期、23例愈合期、29例疤痕期。同期选择95例健康体检者为对照组，男50例，女45例；年龄20~73(43.09±3.09)岁。各组性别、年龄等资料比较差异无统计学意义(P>0.05)。患者均签署知情同意书，且经过重庆市长寿区人民医院医学伦理委员会许可。

1.2 主要试剂和仪器

人DEFA酶联免疫吸附法试剂盒购自上海江莱生物科技有限公司(批号：151203)。人visfatin酶联免疫吸附法试剂盒购自上海润裕生物有限公司(批号：150721)。人IL-17酶联免疫吸附法试剂盒购自上海科敏生物科技有限公司(批号：150927)。

5840R台式冷冻高速离心机购自德国Eppendorf公司。GD(J)W-100低温箱购自东莞市欣宝仪器有限公司。MBY-MK3全波长酶标仪购自北京中西远大科技有限公司。

1.3 检测指标

采集各组空腹外周静脉血4 mL，于血清分离机中按3 000 r/min离心10 min，放置于−20 ℃低温

冰箱中待检。用酶联免疫吸附法测定血清DEFA，visfatin，IL-17水平。以上操作均严格参照说明书进行。

1.4 统计学处理

采用SPSS 18.0软件进行分析，用均数±标准差($\bar{x}\pm s$)表示计量资料，比较采用独立样本t检验，多组间比较选用方差分析；计数资料比较用χ^2检验，相关性的分析采用Pearson相关系数，选用受试者工作特征(receiver-operating characteristic，ROC)曲线分析诊断效能，P<0.05为差异有统计学意义。

2 结果

2.1 消化性溃疡组和对照组血清 DEFA，visfatin，IL-17 水平比较

消化性溃疡组血清DEFA水平低于对照组，血清visfatin，IL-17水平高于对照组，差异有统计学意义(P<0.05，表1)。

2.2 消化性溃疡不同类型组血清 DEFA，visfatin，IL-17 水平比较

胃溃疡及十二指肠溃疡组血清DEFA，visfatin，IL-17水平比较差异无统计学意义(P<0.05)；复合性溃疡组血清DEFA水平低于胃溃疡组及十二指肠溃疡组，血清visfatin，IL-17水平高于胃溃疡组及十二指肠溃疡组，差异有统计学意义(P<0.05，表2)。

2.3 消化性溃疡 *Hp* 阴性及 *Hp* 阳性组血清 DEFA，visfatin，IL-17 水平比较

消化性溃疡*Hp*阴性组血清DEFA水平高于HP I型组及HP II型组(P<0.05)；血清visfatin、IL-17水平高于HP I型组及HP II型组(P<0.05，表3)。

2.4 消化性溃疡不同病情程度组血清 DEFA，visfatin，IL-17 水平比较

消化性溃疡患者活动期血清DEFA低于愈合期且低于疤痕期，visfatin，IL-17水平高于愈合期且高于疤痕期，差异有统计学意义(P<0.05，表4)。

2.5 消化性溃疡患者血清 DEFA，visfatin，IL-17 水平相关性分析

消化性溃疡患者血清DEFA和visfatin呈负相关(r=−0.526)，DEFA和IL-17呈负相关(r=−0.654)，visfatin和IL-17呈正相关(r=0.404，图1)。

2.6 血清 DEFA，visfatin，IL-17 水平对消化性溃疡的诊断效能

ROC曲线显示：血清DEFA水平诊断AUC为0.756，敏感性及特异性分别为0.824，0.565；visfatin水平诊断AUC为0.652，敏感性及特异性分别为0.480，0.858；IL-17水平诊断AUC为0.830，敏感性及特异性分别为0.706，0.836；DEFA+visfatin+IL-17水平诊断AUC为0.892，敏感性及特异性分别为0.784，0.869(图2，表5)。

表1 消化性溃疡组和对照组血清DEFA，visfatin，IL-17水平比较($\bar{x}\pm s$)

Table 1 Comparison of the serum levels of DEFA, visfatin, IL-17 between the peptic ulcer group and the control group ($\bar{x}\pm s$)

组别	n	DEFA/(ng·L^{-1})	Visfatin/(pg·mL^{-1})	IL-17/(pg·mL^{-1})
消化性溃疡组	102	86.20 ± 10.33	379.10 ± 50.34	208.42 ± 28.77
对照组	95	146.11 ± 19.20	308.42 ± 38.71	161.09 ± 20.16
t		27.523	10.989	13.282
P		<0.05	<0.05	<0.05

表2 消化性溃疡不同类型组血清DEFA，visfatin，IL-17水平比较($\bar{x}\pm s$)

Table 2 Comparison of the serum DEFA, visfatin, IL-17 levels in different types of peptic ulcers ($\bar{x}\pm s$)

组别	n	DEFA/(ng·L^{-1})	Visfatin/(pg·mL^{-1})	IL-17/(pg·mL^{-1})
胃溃疡组	34	90.75 ± 12.43	368.10 ± 44.30	191.43 ± 23.17
十二指肠溃疡组	53	92.31 ± 10.29	362.47 ± 48.15	187.50 ± 26.48
复合性溃疡组	15	54.29 ± 5.71	462.79 ± 71.76	320.84 ± 49.55
F		80.357	23.813	124.424
P		<0.05	<0.05	<0.05

表3 消化性溃疡*Hp*阴性及*Hp*阳性组血清DEFA，visfatin，IL-17水平比较($\bar{x} \pm s$)

Table 3 Comparison of the serum DEFA, visfatin, IL-17 levels between the peptic ulcer *Hp* negative and *Hp* positive group ($\bar{x} \pm s$)

组别	*n*	DEFA/(ng·L^{-1})	Visfatin/(pg·mL^{-1})	IL-17/(pg·mL^{-1})
*Hp*阴性组	28	109.42 ± 14.28	339.80 ± 38.32	180.47 ± 22.80
HP I型组	55	81.16 ± 10.16	370.77 ± 45.31	209.56 ± 28.75
HP II型组	19	66.57 ± 5.00	461.12 ± 82.61	246.30 ± 37.62
F		102.242	31.668	28.948
P		<0.05	<0.05	<0.05

表4 消化性溃疡不同病情程度组血清DEFA，visfatin，IL-17水平比较($\bar{x} \pm s$)

Table 4 Comparison of the serum DEFA, visfatin, IL-17 levels in peptic ulcer of different disease degree group ($\bar{x} \pm s$)

组别	*n*	DEFA/(ng·L^{-1})	Visfatin/(pg·mL^{-1})	IL-17/(pg·mL^{-1})
活动期	50	69.20 ± 8.76	420.51 ± 60.53	251.09 ± 36.57
愈合期	23	88.12 ± 11.39	381.75 ± 48.02	215.10 ± 30.21
疤痕期	29	113.98 ± 12.19	305.60 ± 34.61	146.79 ± 14.17
F		169.586	45.515	108.386
P		<0.05	<0.05	<0.05

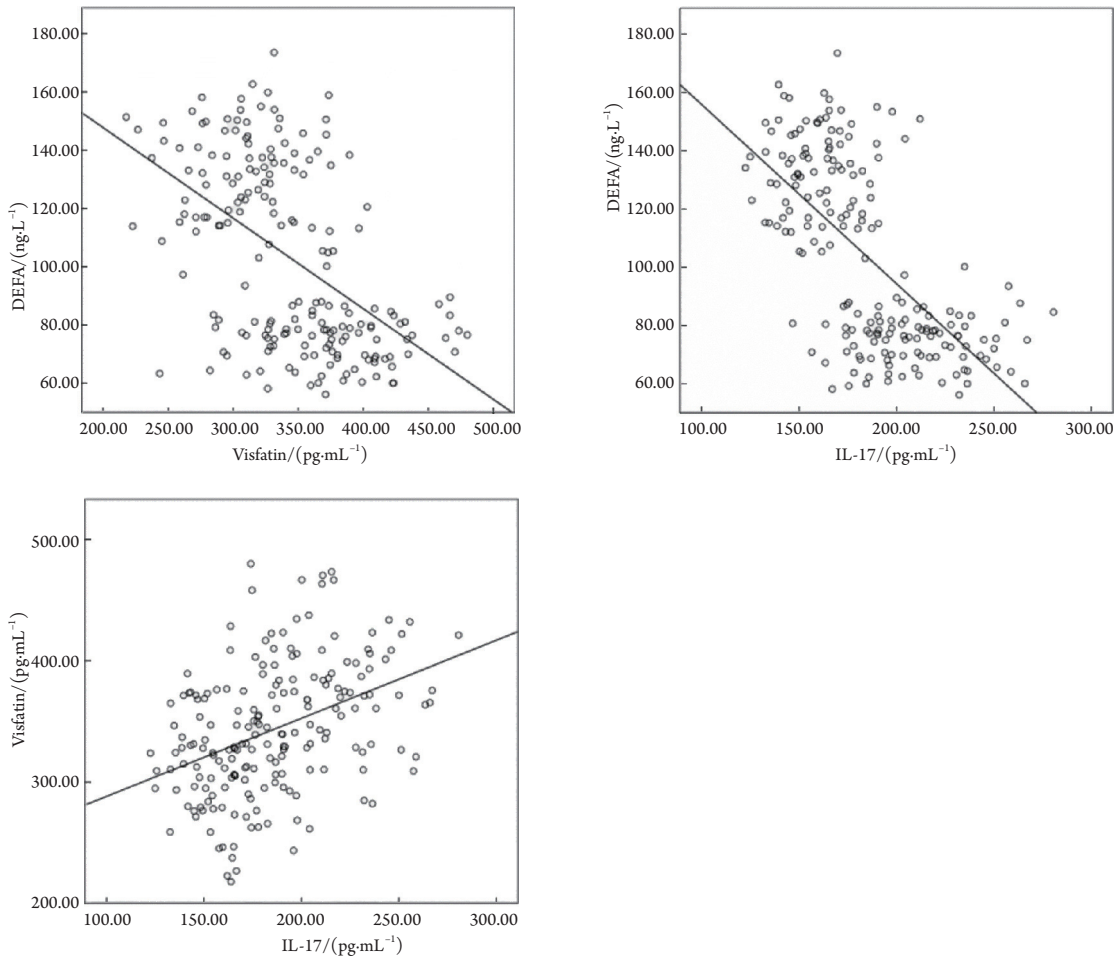

图1 消化性溃疡患者血清DEFA，visfatin，IL-17水平相关性分析

Figure 1 Correlation analysis of serum DEFA, visfatin and IL-17 levels in patients with peptic ulcer

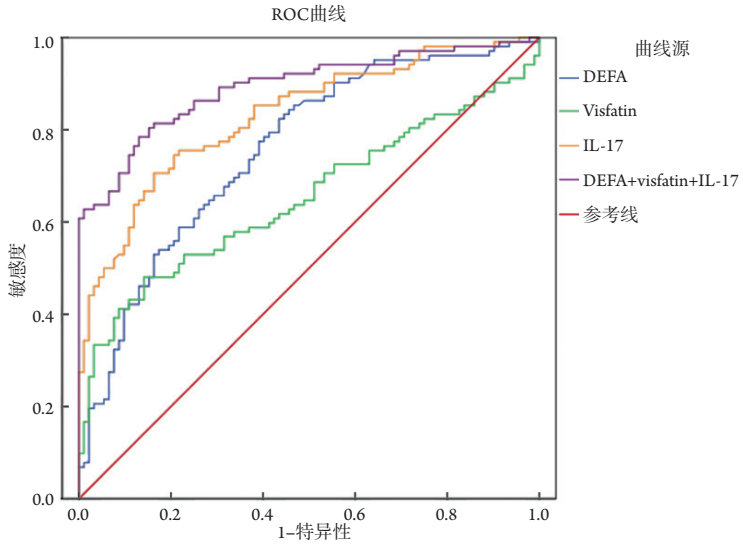

图2 ROC曲线分析

Figure 2 Analysis of ROC curve

表5 血清DEFA，visfatin，IL-17水平对消化性溃疡的诊断分析

Table 5 Analysis of serum levels of DEFA, visfatin and IL-17 in the diagnosis of peptic ulcer

指标	AUC	SE	*P*	95% CI	Cutoff值	特异度	敏感度
DEFA	0.8756	0.035	0.108	0.688~0.824	0.455	0.824	0.565
visfatin	0.652	0.040	0.000	0.574~0.730	0.584	0.480	0.858
IL-17	0.830	0.029	0.000	0.774~0.887	0.575	0.706	0.836
DEFA+visfatin+IL-17	0.892	0.023	0.000	0.846~0.938	0.553	0.784	0.869

3 讨论

消化性溃疡为消化系统的多发病及常见病，是累及黏膜和黏膜下层的病变，可引起多种临床表现。消化性溃疡作为一种炎症性疾病，相关研究[8]报道其启动和发展与免疫炎症反应有紧密联系，其中细胞因子失衡可能为其重要的发病机制之一。

DEFA为小分子的多功能抗菌肽，具有免疫趋化、杀菌活性等作用，参与机体适应性免疫反应及固有免疫[9]。其作为一种广谱抗菌肽，一方面可经自身免疫佐剂参与间接抗菌作用，另一方面又可加强巨噬细胞的吞噬反应，诱导中性粒细胞聚集，激活补体，趋化未成熟的单核细胞及树突状细胞，从而控制炎症反应[10]。体外试验[11]报道：DEFA能够杀灭白色念球菌、肠球菌及大肠杆菌。Koh等[12]研究发现：DEFA的表达与机体基因蛋白水平有关，并指出消化性溃疡患者机体血清DEFA水平相对较低。本研究显示：消化性溃疡组DEFA水平低于健康对照组，与研究报道结果相似，说明其水平能够辅助消化性溃疡的诊断。复合性溃疡为消化性溃疡的特殊类型，发病率相对较低，但容易引起消化道出血，可以穿孔、出血等并发症为首发症状，危险性高，因此及时诊治有重要价值[13]。本研究发现：复合性溃疡组血清DEFA水平明显低于胃溃疡或者十二指肠溃疡组，说明其有利于消化性溃疡类型的鉴别，从而便于后续治疗的开展。近年来的实验[14]表明：*Hp*感染是引起消化性溃疡的主要环节，其分泌的毒素可损伤胃黏膜，促进胃酸分泌，加重病情。本研究发现：*Hp*阴性组血清DEFA水平高于HP I型组及HP II型组，提示通过测定其水平有利于临床区分患者有无*Hp*感染，指导临床治疗。且随着患者病情不断好转，DEFA水平呈上升趋势，说明其能预测疗效。

Visfatin是来自于脂肪细胞的细胞因子，多种生物学活性，如诱导多种炎性因子表达，参与急慢性炎症病变的发生发展[15]。动物实验[16]报道：visfatin在小鼠内脏脂肪组织中呈高表达，也可表

达于肝、肌肉、皮下脂肪等组织。免疫细胞和脂肪组织可表达多种相同基因，有关研究推测其不仅参与机体代谢途径，还可调控免疫应答[17]。炎症刺激物对单核细胞及中性粒细胞的visfatin有上调作用，国外研究[18]已证实：炎症性肠病患者血清visfatin水平明显上升。本结果显示：消化性溃疡组血清visfatin水平高于较健康对照组组低，说明其水平上升和机体炎症反应有一定关联。同时本研究发现：血清visfatin水平在复合性溃疡、HP I型及HP II型及活动期组明显上升，提升其水平能够判断疾病，可能与其水平急剧上升或者过度表达能够放大机体的炎症反应，加剧病情有关，可作为消化性溃疡诊断的敏感标志物。但visfatin的生理活性存在多样性，因此其在消化性溃疡中的机制有待更多探讨。

IL-17为Th1型细胞因子，可促进中性粒细胞及单核细胞的生成，刺激前列腺素E2及IL-6的表达，加强局部炎症，导致黏膜破坏[19]的同时能够诱导角质细胞、成纤维细胞、内皮细胞分泌多种炎性物质，发挥促炎症作用[20]。已有研究[21]证实：其在自身免疫性病变、类风湿性关节炎中的表达明显上升。IL-17能够起到辅助性免疫调节作用，可能影响相关性胃疾病的病变程度[22]。结果显示：消化性溃疡患者血清IL-17水平显著上升，证实此类患者伴明显的炎症反应，另一方面又说明检测血清IL-17水平能够辅助此类疾病的诊断。本研究也发现随着疾病类型的加重其表达相应上调，提示其可反应疾病进展程度。相关性分析显示：消化性溃疡患者血清DEFA，visfatin及IL-17之间有良好相关性，说明其存在一定联系，考虑为机体处于炎症状态时能够诱导巨噬细胞、单核细胞大量表达，从而影响DEFA分泌，并刺激visfatin及IL-17表达，引起其水平相应改变。ROC曲线显示DEFA，visfatin及IL-17联合检测的AUC明显高于单独检测，说明联合测定的临床价值更高。但本研究尚存指标观察不够全面、样本量有限等不足，因此有待更多大规模、大样本试验进一步论证和分析。

综上所述，DEFA，visfatin及IL-17均可参与消化性溃疡发病，其水平改变可能和炎症程度有关，可作为临床重要的观察指标。

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