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原发性肝癌患者肝切除术前营养风险筛查及营养支持对营养风险患者康复效果的对照研究 *

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摘要 目的：观察原发性肝癌 (PLC) 肝切除术前营养风险，并研究营养支持对营养风险患者康复效果的影响。**方法：**选择我院 2021 年 7 月 ~2021 年 12 月期间收治的 PLC 患者 99 例，采用营养风险筛查 2002 (NRS2002) 量表评估患者的营养风险，单因素及多因素 Logistic 回归分析 PLC 患者肝切除术前发生营养风险的影响因素。根据有无营养风险分为营养风险组（n=64）和无营养风险组（n=35），其中营养风险组患者采用随机数字表法分为术前未接受营养支持组和术前接受营养支持组，各 32 例。其中术前未接受营养支持组术前不接受营养支持，术前接受营养支持组术前接受营养支持，对比术前未接受营养支持组、术前接受营养支持组的康复效果。**结果：**经营养风险筛查结果显示，99 例 PLC 患者中有 64 例术前就已存在营养风险。单因素分析结果显示，无营养风险组、营养风险组在肿瘤直径、贫血、临床分期、家庭月收入、年龄、并发乙肝方面对比存在明显差异（P<0.05）。年龄为 60~ 岁、家庭月收入 <3000 元、临床分期为Ⅱ期、贫血、并发乙肝均是 PLC 患者肝切除术前发生营养风险的危险因素（P<0.05）。术前接受营养支持组的住院时间、首次排气时间、排便时间均短于术前未接受营养支持组（P<0.05）。两组术后 7 d 白蛋白、前白蛋白、血红蛋白水平均下降，但术前接受营养支持组高于术前未接受营养支持组（P<0.05）。术前未接受营养支持组、术前接受营养支持组的并发症总发生率组间对比无统计学差异（P>0.05）。**结论：**PLC 患者肝切除术前发生营养风险的比例较高，且受到多种因素影响，术前给予营养支持可促进患者术后恢复，有效调节患者术后营养水平。

关键词：原发性肝癌；肝切除术；营养支持；营养风险；康复效果

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A Control Study on Rehabilitation Effect of Nutritional Risk Screening and Nutritional Support before Hepatectomy in Patients with Primary Liver Cancer*

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ABSTRACT Objective: To observe the nutritional risk before hepatectomy in primary liver cancer (PLC), and to study the effect of nutritional support on the rehabilitation effect of patients with nutritional risk. **Methods:** 99 patients with PLC who were treated in our hospital from July 2021 to December 2021 were selected. The nutritional risk of patients was evaluated by nutritional risk screening 2002 (NRS2002). Univariate and multivariate Logistic regression analysis of nutritional risk influence factors in patients with PLC before hepatectomy. They were divided into nutritional risk group (n=64) and non-nutritional risk group (n=35) according to nutritional risk. Patients in the nutritional risk group were divided into the group without receiving nutritional support before surgery and the group receiving nutritional support before surgery by random number table method, 32 cases in each group. Among them, the group without receiving nutritional support before surgery that did not receive nutritional support before surgery, and the group receiving nutritional support before surgery received nutritional support before surgery. The rehabilitation effect of the group without receiving nutritional support before surgery and group receiving nutritional support before surgery was compared. **Results:** Nutritional risk screening results showed that 64 cases of 99 PLC patients already had nutritional risk before surgery. Univariate analysis showed that there were significant differences in tumor diameter, anemia, clinical stage, monthly family income, age and complicated with hepatitis B between the non-nutritional risk group and the nutritional risk group (P<0.05). The risk factors of nutritional risk of patients with PLC before hepatectomy were age 60~years old, place of residence in rural area, monthly family income <3000 yuan, medical expense source at own expense, clinical stage Ⅱ, anemia and complicated with hepatitis B (P<0.05). The hospital stay, first exhaust time, defecation time in the group receiving nutritional support before surgery were shorter than those in the group without receiving nutritional support before surgery (P<0.05). The levels of albumin, prealbumin and hemoglobin in both groups decreased at 7 d after surgery, but those in the group receiving nutritional support

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before surgery were higher than those in the group without receiving nutritional support before surgery (P<0.05). There was no statistical difference in the total incidence of complications between the group without receiving nutritional support and the group receiving nutritional support before surgery (P>0.05). **Conclusion:** The patients with PLC have a high proportion of nutritional risks before hepatectomy and are affected by a variety of factors. Preoperative nutritional support can promote postoperative recovery and effectively regulate postoperative nutritional levels of patients.

Key words: Primary liver cancer; Hepatectomy; Nutritional support; Nutritional risk; Rehabilitation effect

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前言

原发性肝癌 (PLC) 是临床的常见恶性肿瘤之一，病死率居全球恶性肿瘤的第 2 位[1]。PLC 起病隐匿，初期症状不明显，随着疾病进展，可表现出肝区疼痛、黑便、黄疸、乏力等[2]。肝切除术是治疗 PLC 患者的常用方法，可在一定程度上改善患者预后[3]。近年来营养状况对恶性肿瘤患者的预后影响逐渐引起临床的重视，术前营养不良可导致术后并发症发生风险增加，降低患者的生存率[4]。适当的营养支持有助于恢复 PLC 患者的营养状况，帮助患者术后恢复[5]。现临床合理的营养支持均以营养风险筛查作为基础，基于此，本研究通过对 PLC 患者行肝切除术前营养风险筛查，并研究营养支持对营养风险患者康复效果的影响，旨在为临床提供循证医学证据。

1 资料与方法

1.1 临床资料

选择我院 2021 年 7 月 ~2021 年 12 月期间收治的 PLC 患者 99 例，纳入标准：(1)PLC 的诊断标准符合相关准则者[6]，经 MRI、CT、实验室指标等检查确诊；(2)患者意识清晰，可正常沟通与交流；(3)临床资料完整者；(4)年龄≥18 岁者；(5)符合手术指征者。排除标准：(1)合并其他恶性肿瘤者；(2)合并精神病病史者；(3)合并有远处转移者；(4)合并严重心、脑血管疾病；(5)合并门静脉堵塞者；(6)预计生存期短于 6 个月者；(7)术前存在营养不良者。我院伦理委员会已批准本研究，所有患者均签署知情同意书。

1.2 方法

1.2.1 营养风险筛查 患者的营养风险采用营养风险筛查 2002 (NRS2002)[7]量表评估，NRS2002 包括疾病严重程度评分、营养状态评分、年龄评分（患者年龄≥70 岁加 1 分），当 NRS2002 总评分在 3 分及其以上时，则认定存在营养风险。

1.2.2 临床资料 回顾患者的病例资料，收集以下临床资料：贫血、年龄、临床分期、性别、Child-Pugh 分级、居住地、医疗费用来源、婚姻状况、肿块数目、文化程度、并存乙肝、肿瘤直径、家庭月收入、体质量指数。

1.2.3 营养支持方法 经营养风险筛查结果显示，99 例 PLC 患者中有 64 例术前就已存在营养风险，根据有无营养风险分为营养风险组(n=64)和无营养风险组(n=35)，其中营养风险组患者采用随机数字表法分为术前未接受营养支持组和术前接受营养支持组，各 32 例。其中术前未接受营养支持组术前不接受营养支持，术前接受营养支持组术前接受营养支持，营养支持包括肠外营养及肠内营养，同时为患者补充必须的营养物质。

1.3 评价指标

(1)观察术前未接受营养支持组、术前接受营养支持组患者的住院时间、首次排气时间、排便时间。(2)全自动生化分析仪测定两组患者术前、术后 7 d 的白蛋白、前白蛋白、血红蛋白水平。(3)比较术前未接受营养支持组、术前接受营养支持组的并发症发生情况。

1.4 统计学方法

本研究中所有数据均采用统计学软件 SPSS24.0 进行统计分析。围术期指标、肿瘤直径等计量资料经正态性检验符合正态分布，用均数± 标准差($\bar{x}\pm s$)描述，比较采用独立样本 检验；并发症发生率、肿块数目、居住地、性别等计数资料用例数表示，组间比较用 x^2 检验。单因素及多因素 Logistic 回归分析 PLC 患者肝切除术前发生营养风险的影响因素。以 P<0.05 认为差异有统计学意义。

2 结果

2.1 PLC 患者肝切除术前发生营养风险的单因素分析

单因素分析结果显示，营养风险组、无营养风险组在年龄、肿瘤直径、家庭月收入、贫血、临床分期、并发乙肝方面对比存在明显差异(P<0.05)。无营养风险组、营养风险组在医疗费用来源、性别、居住地、文化程度、婚姻状况、体质量指数、肿块数目、Child-Pugh 分级方面对比无明显差异(P>0.05)。见表 1。

2.2 PLC 患者肝切除术前发生营养风险的多因素 Logistic 回归分析

以 PLC 患者肝切除术前营养风险为因变量，赋值 1= 发生、0= 未发生；以表 1 中差异有统计学意义的因素为自变量，构建多因素 Logistic 回归分析模型，采用 ENTER 法，最终分析结果显示：家庭月收入 <3000 元、年龄为 60~ 岁、贫血、临床分期为Ⅱ期、并发乙肝均是 PLC 患者肝切除术前发生营养风险的危险因素(P<0.05)。见表 2。

2.3 术前未接受营养支持组、术前接受营养支持组的围术期指标对比

术前接受营养支持组的住院时间、首次排气时间、排便时间均短于术前未接受营养支持组(P<0.05)，见表 3。

2.4 术前未接受营养支持组、术前接受营养支持组的血清指标对比

两组术前白蛋白、前白蛋白、血红蛋白水平对比无统计学差异(P>0.05)。两组术后 7 d 白蛋白、前白蛋白、血红蛋白水平均下降，但术前接受营养支持组高于术前未接受营养支持组(P<0.05)，见表 4。

表 1 PLC 患者肝切除术前发生营养风险的单因素分析

Table 1 Univariate analysis of nutritional risk of patients with PLC before hepatectomy

Factors		Nutritional risk group (n=64)	Non-nutritional risk group(n=35)	x^2/t	*P*
Gender(n)	Male	34(53.13%)	19(54.29%)	0.012	0.912
	Female	30(46.88%)	16(45.71%)		
Age(years)	18~	11(17.19%)	15(42.86%)	9.443	0.000
	46~	22(34.38%)	12(34.29%)		
	60~	31(48.44%)	8(22.86%)		
Marital status(n)	Unmarried	10(15.63%)	5(14.29%)	0.053	0.976
	Married	26(40.63%)	14(40.00%)		
	Divorced or widowed	28(43.75%)	16(45.71%)		
Place of residence(n)	Rural area	31(48.44%)	19(54.29%)	0.310	0.578
	Town	33(51.56%)	16(45.71%)		
Education degree(n)	Junior high school and below	28(43.75%)	15(42.86%)	0.018	0.993
	High school or technical secondary school	22(34.38%)	12(34.29%)		
	College degree or above	14(21.88%)	8(22.86%)		
Monthly family income(yuan)	<3000	29(45.31%)	6(17.14%)	9.452	0.000
	3000~5000	21(32.81%)	13(37.14%)		
	>5000	14(21.88%)	16(45.71%)		
Medical expense source(n)	At own expense	2(3.13%)	1(2.86%)	0.013	0.941
	Non self expense	62(96.88%)	34(97.14%)		
Number of masses(n)	Single shot	33(51.56%)	18(51.43%)	0.000	0.990
	Multiple	31(48.44%)	17(48.57%)		
Clinical stage(n)	Ⅰstage	25(39.06%)	21(60.00%)	3.987	0.046
	IIstage	39(60.94%)	14(40.00%)		
Body mass index (kg/m^2)	<18.5	25(39.06%)	14(40.00%)	0.018	0.993
	18.5~24.0	20(31.25%)	11(31.43%)		
	>24.0	19(29.69%)	10(28.57%)		
Child-Pugh classification(n)	A	36(56.25%)	20(57.14%)	0.038	0.864
	B	29(45.31%)	15(42.86%)		
Anemia(n)	Yes	41(64.06%)	14(40.00%)	5.318	0.021
	No	23(35.94%)	21(60.00%)		
Complicated with hepatitis B(n)	Yes	43(67.19%)	13(37.14%)	8.319	0.003
	No	21(32.81%)	22(62.86%)		
Tumor diameter(cm)	<5	23(35.94%)	23(65.71%)	8.065	0.005
	⩾5	41(64.06%)	12(34.29%)		

2.5 两组并发症发生率对比 术前未接受营养支持组、术前接受营养支持组的并发症总发生率对比无差异(*P*>0.05),见表 5。

表 2 PLC 患者肝切除术前发生营养风险的多因素 Logistic 回归分析

Table 2 Multivariate Logistic regression analysis of nutritional risk of patients with PLC before hepatectomy

Factors	β	SE	Wald x^2	OR(95%CI)	*P*
Constant	3.141	1.187	7.942	-	0.000
Age 60~years old(18~years old=0, 46~years old=1, 60~years old=2)	0.339	0.298	6.184	1.492(1.115～2.382)	0.007
Monthly family income<3000 yuan(>5000 yuan=0, 3000~5000 yuan=1, <3000 yuan=2)	0.347	0.186	7.994	1.474(1.294～1.928)	0.000
Clinical stage II(Ⅰ stage =0, II stage =1)	0.361	0.152	7.893	1.964(1.225～2.765)	0.000
Anemia(no=0, yes=1)	0.474	0.183	9.572	1.885(1.309～2.571)	0.000
Complicated with hepatitis B(no=0, yes=1)	0.438	0.125	10.942	1.983(1.269～2.995)	0.000

表 3 术前未接受营养支持组、术前接受营养支持组的临床指标对比($\bar{x}\pm s$)

Table 3 Comparison of clinical indexes between the group without receiving nutritional support before surgery and the group receiving preoperative nutritional support before surgery($\bar{x}\pm s$)

Groups	First exhaust time(h)	Hospital stay(d)	Defecation time(h)
Group without receiving nutritional support before surgery(n=32)	22.08± 4.96	10.23± 2.07	26.19± 3.56
Group receiving preoperative nutritional support before surgery(n=32)	16.95± 3.82	6.37± 2.19	21.23± 2.74
t	19.374	12.482	20.364
P	<0.001	<0.001	<0.001

表 4 术前未接受营养支持组、术前接受营养支持组的血清指标对比($\bar{x}\pm s$)

Table 4 Comparison of serum indexes between the group without receiving nutritional support before surgery and the group receiving preoperative nutritional support before surgery($\bar{x}\pm s$)

Groups	Albumin(g/L)		Prealbumin(mg/L)		Hemoglobin(g/L)	
	Before surgery	7 d after surgery	Before surgery	7 d after surgery	Before surgery	7 d after surgery
Group without receiving nutritional support before surgery(n=32)	32.38± 3.47	21.28± 3.20[a]	160.69± 18.08	86.32± 15.39[a]	108.34± 11.38	73.69± 8.14[a]
Group receiving preoperative nutritional support before surgery(n=32)	33.14± 3.52	27.38± 3.15[a]	161.02± 20.37	103.95± 17.46[a]	107.84± 9.22	89.55± 7.06[a]
t	-0.870	-7.865	0.347	-6.715	0.193	-8.326
P	0.388	0.000	0.739	0.000	0.847	0.000

Note: Compared with before surgery, [a]*P*<0.05.

表 5 两组并发症发生率对比 [例(%)]

Table 5 Comparison of complication rates between the two groups [n(%)]

Groups	Infection	Pleural effusion	Total incidence rate
Group without receiving nutritional support before surgery(n=32)	1(3.13)	1(3.13)	2(6.25)
Group receiving preoperative nutritional support before surgery(n=32)	0(0.00)	1(3.13)	1(3.13)
x^2			0.736
P			0.391

3 讨论

肝切除是 PLC 患者的首选治疗方案，不少报道均已证实肝切除治疗 PLC 患者的有效性,可帮助 PLC 患者延长生存期[8,9]。

但 PLC 患者术前往往存在营养风险，手术过程中的应激反应可造成营养物质代谢障碍、摄入不足和高代谢情形，不利于患者术后恢复[10]。本次研究入选的 99 例 PLC 患者，有 64 例存在营养风险，发生率为 64.65%。可见有不少 PLC 患者术前就已存在营养风险。肝脏是身体内以代谢功能为主的一个器官，人体每天摄入食物中的各种营养物质如维生素、碳水化合物、脂肪、蛋白质和矿物质等均需要通过肝脏代谢[11,12]。而 PLC 中的癌细胞可影响肝功能，从而影响上述物质的代谢与合成，患者身体肌肉和脏器肌肉也会随之减少或缺乏，从而导致营养风险的增加[13,14]。此外，肝癌的主要临床症状为肝区疼痛、纳差、腹胀等，这些临床症状均可导致患者食欲下降，长期的能力摄入不足，可导致蛋白合成减少，免疫功能下降，极易发生营养风险[15]。同时，癌症疾病的进展可导致肿瘤细胞增多，进而使得细胞膜外的组织液积聚过多，也会增加营养风险[16]。营养风险不利于临床结局，因此，了解影响营养风险的危险因素，对改善 PLC 患者的营养状况具有极其重要的临床意义。

本次研究结果显示，PLC 患者肝切除术前发生营养风险的危险因素包括年龄为 60~ 岁、家庭月收入≦3000 元、临床分期为 II 期、贫血、并发乙肝。年龄为 60~ 岁存在营养风险的原因是：此类患者常合并基础性疾病，病情复杂，加上因各种原因引起的消化道症状导致食欲减退，极易发生营养不良[17,18]。提示临床治疗中，应重视年龄为 60~ 岁患者的营养摄入。临床治疗过程中可针对此类群体加强普及营养相关知识，提高此类患者对营养风险的重视度。低收入是 PLC 患者术前营养风险的危险因素，主要是此类患者在选择治疗方案时更多的是考虑经济因素，受限于经济原因无法选择最佳的治疗方法，极易发生营养风险[19-21]。因此，临床在制定营养支持方案时，除了需保证食物的营养品质外，还应尽可能避免高价格食谱。临床分期较高的患者营养风险也较高，主要是分期越高，病情越严重，原发灶肿瘤数量为多发，瘤体也更大，过大或较多的瘤体营养消耗巨大，易发生营养风险[22,23]。建议对此类患者配备专职监护人员并制定个性化营养支持方案，尽量降低其营养风险。此外，贫血易导致营养风险的主要原因是贫血易导致疲乏程度，患者免疫力下降，同时贫血也易合并感染和心力衰竭，导致营养风险增加[24,25]。建议对贫血患者加强粗粮饮食、高铁食物摄取，倡导均衡饮食与健康的生活方式，从根本上解决铁元素缺乏引起的贫血问题。研究显示，乙肝是肝癌的主要风险之一，这主要是因为乙肝可直接或间接的促进了肝癌的发生[26,27]。本研究显示乙肝也是术前营养风险的危险因素之一，考虑主要是因为乙肝影响了肝功能障碍，从而引起营养不良。本次研究就术前存在营养风险的患者设置对照研究，结果显示，术前接受营养支持的患者，术后恢复更为迅速，且营养指标下降程度更轻，安全可靠。表明术前给予营养支持有助于患者手术效果改善，给予营养支持后，有助于存在营养风险的患者储备营养物质，改善患者术后营养状况[28-30]。

综上所述，PLC 患者肝切除术前发生营养风险的比例较高，且受到多种因素影响，术前给予营养支持可促进患者术后恢复，有效调节患者术后营养水平。应尽早进行营养风险筛查，并给予营养干预治疗，以期促进 PLC 患者术后康复。

参 考 文 献（References）

[1] Sung H, Ferlay J, Siegel RL, et al. Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries[J]. CA Cancer J Clin, 2021, 71(3): 209-249

[2] Li X, Ramadori P, Pfister D, et al. The immunological and metabolic landscape in primary and metastatic liver cancer [J]. Nat Rev Cancer, 2021, 21(9): 541-557

[3] Liu JB, Chu KJ, Ling CC, et al. Prognosis for intrahepatic cholangiocarcinoma patients treated with postoperative adjuvant transcatheter hepatic artery chemoembolization[J]. Curr Probl Cancer, 2020, 44(6): 100612

[4] Barrea L, Gallo M, Ruggeri RM, et al. Nutritional status and follicular-derived thyroid cancer: An update [J]. Crit Rev Food Sci Nutr, 2021, 61(1): 25-59

[5] Nakamura N, Kinami S, Fujita J, et al. Relationship between fatty liver change and nutritional status after total gastrectomy in gastric cancer patients: a retrospective study[J]. BMC Surg, 2021, 21(1): 325

[6] 中华人民共和国国家卫生健康委员会医政医管局. 原发性肝癌诊疗规范(2019 年版)[J]. 中华消化外科杂志, 2020, 19(1): 1-20

[7] 陈瑛翼, 郑洁, 吴小玲, 等. 营养风险筛查 2002 在呼吸系统疾病患者中的应用效果[J]. 中国临床医学, 2020, 27(5): 735-741

[8] 刘欣, 母齐鸣, 王刚, 等. 解剖性肝叶切除与非解剖性肝叶切除治疗原发性肝癌的疗效对比研究 [J]. 现代生物医学进展, 2020, 20(8): 1519-1522, 1527

[9] Li S, Lyu N, Han X, et al. Hepatic Artery Infusion Chemotherapy Using Fluorouracil, Leucovorin, and Oxaliplatin versus Transarterial Chemoembolization as Initial Treatment for Locally Advanced Hepatocellular Carcinoma: A Propensity Score-Matching Analysis[J]. J Vasc Interv Radiol, 2021, 32(9): 1267-1276.e1

[10] Latino-Martel P, Srour B, Ginhac J, et al. During and after cancer: identification of high-risk nutritional situations[J]. Rev Prat, 2021, 71 (2): 155-159

[11] Yasutake K, Koga S, Hokko Y, et al. Relevance of the Mini Nutritional Assessment in cirrhotic liver disease patients [J]. Asia Pac J Clin Nutr, 2018, 27(2): 300-305

[12] Tsai AC, Hsu WC, Chan SC, et al. Usefulness of the mini nutritional assessment in predicting the nutritional status of patients with liver cancer in Taiwan[J]. Nutr Cancer, 2011, 63(3): 334-341

[13] Mantzorou M, Koutelidakis A, Theocharis S, et al. Clinical Value of Nutritional Status in Cancer: What is its Impact and how it Affects Disease Progression and Prognosis? [J]. Nutr Cancer, 2017, 69 (8): 1151-1176

[14] Na BG, Han SS, Cho YA, et al. Nutritional Status of Patients with Cancer: A Prospective Cohort Study of 1,588 Hospitalized Patients[J]. Nutr Cancer, 2018, 70(8): 1228-1236

[15] Ciuni R, Biondi A, Grosso G, et al. Nutritional aspects in patient undergoing liver resection[J]. Updates Surg, 2011, 63(4): 249-252

[16] Bo Y, Yao M, Zhang L, et al. Preoperative Nutritional Risk Index to predict postoperative survival time in primary liver cancer patients[J]. Asia Pac J Clin Nutr, 2015, 24(4): 591-597

[17] 栗志磊, 许业传, 王梦宇. 老年人营养风险指数对老年肝癌切除术患者术后并发症的预测价值[J]. 安徽医学, 2020, 41(6): 653-656

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Associated With Increased Plasma Levels of Triglycerides, via Effects on the Lipoprotein Lipase Pathway, Increase Risk of Acute Pancreatitis [J]. Clin Gastroenterol Hepatol, 2021, 19(8): 1652-1660

[20] Abu-Farha M, Ghosh A, Al-Khairi I, et al. The multi-faces of Angptl8 in health and disease: Novel functions beyond lipoprotein lipase modulation [J]. Prog Lipid Res, 2020, 80: 101067

[21] Young SG, Fong LG, Beigneux AP, et al. GPIHBP1 and Lipoprotein Lipase, Partners in Plasma Triglyceride Metabolism [J]. Cell Metab, 2019, 30(1): 51-65

[22] Ghizlane EA, Manal M, Salma T, et al. Hypertriglyceridemia revealing acute pancreatitis: A case report [J]. Ann Med Surg (Lond), 2021, 70: 102914

[23] Kim AS, Hakeem R, Abdullah A, et al. Therapeutic plasma exchange for the management of severe gestational hypertriglyceridaemic pancreatitis due to lipoprotein lipase mutation [J]. Endocrinol Diabetes Metab Case Rep, 2020, 2020: 19-0165

[24] 许锦平,白海涛,姚拥华,等.脂蛋白脂酶基因突变致儿童高三酰甘油血症性胰腺炎一例报道并文献复习 [J]. 中国全科医学,2021,24(21): 2752-2756

[25] 王晔龙, 于海文, 沈华. 血清三酰甘油水平与急性胰腺炎患者的病情严重程度及生存率的关系研究[J]. 国际消化病杂志, 2019, 39(1): 65-69

[26] Furey C, Buxbaum J, Chambliss AB. A review of biomarker utilization in the diagnosis and management of acute pancreatitis reveals amylase ordering is favored in patients requiring laparoscopic cholecystectomy [J]. Clin Biochem, 2020, 77: 54-56

[27] Piao X, Zou Y, Sui X, et al. Hydrostatin-SN10 Ameliorates Pancreatitis-Induced Lung Injury by Affecting IL-6-Induced JAK2/STAT3-Associated Inflammation and Oxidative Stress [J]. Oxid Med Cell Longev, 2019, 2019: 9659757

[28] Hagar HH, Almubrik SA, Attia NM, et al. Mesna Alleviates Cerulein-Induced Acute Pancreatitis by Inhibiting the Inflammatory Response and Oxidative Stress in Experimental Rats [J]. Dig Dis Sci, 2020, 65(12): 3583-3591

[29] Ismail OZ, Bhayana V. Lipase or amylase for the diagnosis of acute pancreatitis?[J]. Clin Biochem, 2017, 50(18): 1275-1280

[30] Mas-Bargues C, Escrivá C, Dromant M, et al. Lipid peroxidation as measured by chromatographic determination of malondialdehyde. Human plasma reference values in health and disease [J]. Arch Biochem Biophys, 2021, 709: 108941

(上接第 2864 页)

[18] 胡娇, 罗艳丽, 肖凤鸣, 等. 营养风险筛查表联合白蛋白水平监测对肝癌患者手术前后营养状况的评估价值[J]. 河北医学, 2019, 25(7): 1129-1132

[19] 张阳, 颜萍, 赵萍, 等. 原发性肝癌患者肌少症发生情况及影响因素[J]. 华南预防医学, 2020, 46(2): 175-177

[20] 朱娅鸽, 吴宇超, 王娟, 等. 两种营养不良风险筛查工具在原发性肝癌住院患者中的应用比较[J]. 医学综述, 2021, 27(8): 1616-1620

[21] 李仕发, 孙占虎, 周涛, 等. 谷氨酰胺对合并营养风险原发性肝癌手术患者肝功能与炎症反应的影响[J]. 湖南师范大学学报(医学版), 2019, 16(2): 99-102

[22] 张晶晶, 刘光芹, 孙勤, 等. 肝癌患者营养风险的影响因素分析[J]. 癌症进展, 2019, 17(9): 1106-1108

[23] 王贺, 林欣, 康军, 等. 重庆某三甲医院不同分期肺癌住院患者营养风险与营养不良发生率横断面研究 [J]. 中华临床营养杂志, 2018, 26(3): 162-169

[24] 王红超, 马志强, 康维明, 等. 胃肠道肿瘤患者营养风险筛查及贫血状况调查[J]. 山西医药杂志, 2015, 44(6): 641-643

[25] 毕研霞, 洪忠新, 张立红, 等. 肿瘤化疗患者营养风险评估及影响因素分析[J]. 中国食物与营养, 2018, 24(3): 66-70

[26] Zeisel MB, Guerrieri F, Levrero M. Host Epigenetic Alterations and Hepatitis B Virus-Associated Hepatocellular Carcinoma [J]. J Clin Med, 2021, 10(8): 1715

[27] Harputluoglu M, Carr BI. Hepatitis B Before and After Hepatocellular Carcinoma[J]. J Gastrointest Cancer, 2021, 52(4): 1206-1210

[28] 徐军辉, 文习刚, 罗金波, 等. 术前营养支持对存在营养风险肝癌患者肝动脉化疗栓塞临床结局的影响 [J]. 中华肝胆外科杂志, 2018, 24(4): 226-230

[29] 李萍, 刘文红, 赵萌, 等. 原发性肝癌肝动脉化疗栓塞术术前营养风险筛查的意义及个体化营养干预效果分析 [J]. 中华全科医学, 2021, 19(7): 1087-1090

[30] 邓照军, 倪志, 陈明霞. 存在营养风险的原发性肝癌患者术前营养支持的效果及对免疫功能的影响[J]. 肝脏, 2019, 24(3): 302-304