

肌少症对食管鳞癌围手术期临床结局的影响

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【摘要】目的 探讨肌少症对食管鳞癌围手术期临床结局的影响。**方法** 采用回顾性病例对照研究方法。收集 2020 年 1 月至 2021 年 12 月南京医科大学附属淮安第一人民医院收治的 1 148 例食管鳞癌患者的临床病理资料; 男 789 例, 女 359 例; 年龄为 (67±7) 岁。所有患者行胸腹腔镜联合食管癌根治术。观察指标: (1) 食管鳞癌患者并发肌少症情况。(2) 食管鳞癌并发肌少症患者与食管鳞癌非肌少症患者的一般资料比较。(3) 食管鳞癌并发肌少症患者与食管鳞癌非肌少症患者的临床结局比较。(4) 食管鳞癌患者并发肌少症的影响因素分析。正态分布的计量资料以 $\bar{x} \pm s$ 表示, 组间比较采用 *t* 检验; 计数资料以绝对数表示, 组间比较采用 χ^2 检验; 等级资料采用 Mann-Whitney *U* 检验。单因素分析采用 Logistic 回归分析, 多因素分析采用 Logistic 逐步回归向后模型。**结果** (1) 食管鳞癌患者并发肌少症情况。1 148 例食管鳞癌患者中, 469 例并发肌少症, 679 例非肌少症, 肌少症发生率为 40.854% (469/1 148)。469 例并发肌少症患者中, 男 313 例, 女 156 例; 年龄 <65 岁、≥65 岁且 <70 岁、≥70 岁且 <75 岁、≥75 岁分别为 125、145、106、93 例。(2) 食管鳞癌并发肌少症患者与食管鳞癌非肌少症患者的一般资料比较。469 例食管鳞癌并发肌少症患者的年龄, 肿瘤长径, 体质量指数, T 分期 (T1 期、T2 期、T3 期), 术前白蛋白, 术前血清前白蛋白, 腰大肌指数, 腰大肌密度分别为 (68±7) 岁, (3.3±1.5) cm, (22.4±2.9) kg/m², 100、105、264 例, (43±4) g/L, (193±38) mg/dL, (3.9±0.8) cm²/m², (48±8) HU; 679 例食管鳞癌非肌少症患者上述指标分别为 (66±7) 岁, (3.2±1.4) cm, (23.8±3.0) kg/m², 173、170、336 例, (44±4) g/L, (206±37) mg/dL, (6.0±2.2) cm²/m², (50±7) HU, 两者上述指标比较, 差异均有统计学意义 (*t*=5.74、2.11、7.57, *Z*=-2.93, *t*=2.25、5.52、20.36、4.18, *P*<0.05)。(3) 食管鳞癌并发肌少症患者与食管鳞癌非肌少症患者的临床结局比较。469 例食管鳞癌并发肌少症患者的术后住院时间、术后住院时间 >30 d、肺炎、急性呼吸衰竭、吻合口瘘、心律失常例数分别为 (17±9) d、32 例、158 例、39 例、33 例、103 例, 679 例食管鳞癌非肌少症患者上述指标分别为 (15±6) d、15 例、102 例、18 例、19 例、85 例, 两者上述指标比较, 差异均有统计学意义 (*t*=4.89, χ^2 =15.04、55.17、18.86、11.52、18.06, *P*<0.05)。(4) 食管鳞癌患者并发肌少症的影响因素分析。多因素分析结果显示: 年龄 ≥65 岁是食管鳞癌患者并发肌少症的独立危险因素 (优势比=1.64, 95% 可信区间为 1.26~2.14, *P*<0.05); 术前血清前白蛋白 ≥200 mg/dL、腰大肌密度 ≥48 HU 和体质量指数 >24 kg/m² 是食管鳞癌患者并发肌少症的独立保护因素 (优势比=0.64、0.72、0.53, 95% 可信区间为 0.50~0.82、0.56~0.92、0.41~0.69, *P*<0.05)。**结论** 年龄 ≥65 岁是食管鳞癌患者并发肌少症的独立危险因素, 而术前血清前白蛋白 ≥200 mg/dL、腰大肌密度 ≥48 HU 和体质量指数 >24 kg/m² 是食管鳞癌患者并发肌少症的独立保护因素。与食管鳞癌非肌少症患者比较, 食管鳞癌并发肌少症患者术后更易发生肺炎、急性呼吸衰竭、吻合口瘘、心律失常等并发症, 且术后住院时间更长。

【关键词】 食管肿瘤; 肌少症; 腰大肌指数; 食管切除术; 并发症; 疗效; 治疗; 手术

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Effect of sarcopenia on the perioperative clinical outcomes of esophageal squamous cell carcinoma

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【 Abstract 】 Objective To investigate the effect of sarcopenia on the perioperative clinical outcomes of esophageal squamous cell carcinoma (ESCC). **Methods** The retrospective case-control study was conducted. The clinicopathological data of 1 148 ESCC patients who were admitted to the Affiliated Huaian No.1 People's Hospital of Nanjing Medical University from January 2020 to December 2021 were collected. There were 789 males and 359 females, aged (67±7)years. All patients underwent thoracoscopic and laparoscopic radical esophagectomy for esophageal cancer. Observation indicators: (1) incidence of sarcopenia in patients with ESCC; (2) comparison of general data between ESCC patients complicated with sarcopenia and those without sarcopenia; (3) comparison of clinical outcomes between ESCC patients complicated with sarcopenia and those without sarcopenia; (4) analysis of influencing factors for sarcopenia in ESCC patients. Measurement data of normal distribution were represented by *Mean±SD*, and comparison between groups was conducted using the *t* test. Count data were represented as absolute numbers, and comparison between groups was conducted using the chi-square test. Ordinal data was analyzed using the Mann-Whitney *U* test. Logistic regression analysis was used to conduct univariate analysis. Logistic backward stepwise regression model was used to conduct multivariate analysis. **Results** (1) Incidence of sarcopenia in patients with ESCC. Among 1 148 ESCC patients, 469 cases were complicated with sarcopenia, 679 were without sarcopenia. The incidence of sarcopenia was 40.854%(469/1 148). Among the 469 patients with sarcopenia, there were 313 males and 156 females. There were 125 cases <65 years old, 145 cases ≥ 65 years old but <70 years old, 106 cases ≥70 years old but <75 years old, 93 cases ≥75 years old, respectively. (2) Comparison of general data between patients with ESCC complicated with sarcopenia and those without sarcopenia. The age, tumor diameter, body mass index, cases in stage T1, T2, T3, preoperative albumin, preoperative serum prealbumin, psoas muscle index, psoas muscle density were (68±7)years, (3.3±1.5)cm, (22.4±2.9)kg/m², 100, 105, 264, (43±4)g/L, (193±38)mg/dL, (3.9±0.8)cm²/m², (48±8)HU of 469 ESCC patients complicated with sarcopenia, versus (66±7)years, (3.2±1.4)cm, (23.8±3.0)kg/m², 173, 170, 336, (44±4)g/L, (206±37)mg/dL, (6.0±2.2)cm²/m², (50±7)HU of 679 ESCC patients without sarcopenia, showing significant differences between the two groups (*t*=5.74, 2.11, 7.57, *Z*=-2.93, *t*=2.25, 5.52, 20.36, 4.18, *P*<0.05). (3) Comparison of clinical outcomes between patients with ESCC complicated with sarcopenia and those without sarcopenia. The duration of postoperative hospital stay, cases with postoperative hospital stay>30 days, pneumonia, acute respiratory failure, anastomotic fistula, and abnormal heart rhythm were (17±9)days, 32, 158, 39, 33, and 103 of 469 ESCC patients complicated with sarcopenia, respectively, versus (15±6)days, 15, 102, 18, 19, and 85 of 679 ESCC patients without sarcopenia, showing significant differences between the two groups (*t*=4.89, χ^2 =15.04, 55.17, 18.86, 11.52, 18.06, *P*<0.05). (4) Analysis of influencing factors for sarcopenia in ESCC patients. Results of multivariate analysis showed that age ≥ 65 years was an independent risk factor for sarcopenia in ESCC patients (*odds ratio*=1.64, 95% *confidence interval* as 1.26–2.14, *P*<0.05). Preoperative serum prealbumin ≥200 mg/dL, psoas muscle density ≥48 HU and body mass index >24 kg/m² were independent protective factors for sarcopenia in ESCC patients (*odds ratio*=0.64, 0.72, 0.53, 95% *confidence interval* as 0.50–0.82, 0.56–0.92, 0.41–0.69, *P*<0.05). **Conclusions** Age ≥65 years is an independent risk factor for sarcopenia in ESCC patients. Preoperative serum prealbumin ≥200 mg/dL, psoas muscle density ≥48 HU and body mass index >24 kg/m² are independent protective factors for sarcopenia in ESCC patients. Compared with patients without sarcopenia, ESCC patients with sarcopenia are more prone to postoperative complications such as pneumonia, acute respiratory failure, anastomotic fistula, and arrhythmia, and have a longer postoperative hospital stay.

【Key words】 Esophageal neoplasms; Sarcopenia; Psoas muscle index; Esophagectomy; Complications; Efficacy; Therapy; Surgery

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食管癌是我国高发消化道恶性肿瘤之一,其发病例数和死亡例数分别位居我国全部恶性肿瘤的第6位和第4位^[1]。食管鳞状细胞癌(以下简称食管鳞癌)是我国最常见的食管癌组织病理学类型^[2]。虽然近20年来,放化疗、靶向以及免疫治疗等治疗技术不断更新,但外科手术为主的综合治疗仍是食管癌患者治疗的首选^[3-10]。食管癌根治术中常需涉及颈、胸、腹操作以及消化道重建,具有手术时间长、操作范围广、创伤大、恢复慢等特点,容易出现肺炎、吻合口瘘等严重并发症^[7,11-14]。肌少症是近年提出的代表肌肉质量和功能损失的疾病,好发于老年及恶性肿瘤患者^[15]。已有的研究结果显示:肌少症是多种恶性肿瘤发生术后并发症等不良预后的危险因素^[16-18]。本研究回顾性分析2020年1月至2021年12月南京医科大学附属淮安第一人民医院胸外科收治的1148例食管鳞癌患者的临床病理资料,探讨肌少症对食管鳞癌围手术期临床结局的影响。

资料与方法

一、一般资料

采用回顾性病例对照研究方法。收集1148例食管鳞癌患者的临床病理资料;男789例,女359例;年龄为(67±7)岁。本研究通过南京医科大学附属淮安第一医院医学伦理委员会审批,批号为KY-2022-037-01。患者及家属均签署手术知情同意书。

二、纳入标准和排除标准

纳入标准:(1)术前1周内行腹部CT平面扫描检查。(2)行胸腹腔镜联合食管癌根治术。(3)术后病理学检查结果为鳞癌。(4)临床病理资料完整。

排除标准:(1)接受新辅助治疗。(2)合并其他恶性肿瘤。(3)术中中转开胸。(4)临床病理资料缺失。

三、手术方法

所有患者行胸腹腔镜联合食管癌根治术(微创McKeown术)^[19-22]。主刀医师为独立操作微创食管癌根治术>600例且具有>15年食管外科工作经验的高级职称医师。患者行单腔气管插管,取左侧侧卧位,经右胸三孔+人工气胸行胸部食管游离及

纵隔淋巴结清扫,放置胸管及纵隔引流管;转仰卧位,腹腔镜行胃游离及腹腔淋巴结清扫,开腹行管状胃制作;左颈部切口,游离颈段食管,切断食管后行食管胃吻合,留置胃管及鼻空肠营养管。

四、观察指标和评价标准

观察指标:(1)食管鳞癌患者并发肌少症情况包括肌少症发生率、性别、年龄分布。(2)食管鳞癌并发肌少症患者与食管鳞癌非肌少症患者的一般资料比较:性别、年龄、高血压病史、糖尿病史、吸烟史、肿瘤位置、肿瘤长径、BMI、T分期、N分期、G分期、术前Alb、术前血清前白蛋白、腰大肌指数(psoas muscle index, PMI)、腰大肌密度。(3)食管鳞癌并发肌少症患者与食管鳞癌非肌少症患者的临床结局比较:手术时间、术后住院时间、术后住院30 d内死亡、术后住院时间>30 d、肺炎、急性呼吸衰竭、吻合口瘘、心律失常、胸腔积液。(4)食管鳞癌患者并发肌少症的影响因素分析:性别、年龄、高血压病史、糖尿病史、吸烟史、肿瘤长径、肿瘤位置、T分期、N分期、G分期、术前Alb、术前血清前白蛋白、腰大肌密度、BMI。

评价标准:以男性 $PMI < 5.24 \text{ cm}^2/\text{m}^2$ 、女性 $PMI < 3.85 \text{ cm}^2/\text{m}^2$ 作为肌少症的诊断标准^[23]。 $PMI = \text{第3腰椎横突层面双侧腰大肌面积}/\text{身高}^2 (\text{cm}^2/\text{m}^2)$ 。腰大肌密度定义为CT检查获得的第3腰椎横突层面双侧腰大肌的平均CT值。第3腰椎横突层面双侧腰大肌面积测量见图1。



注:浅绿色区域为双侧腰大肌面积

图1 第3腰椎横突层面双侧腰大肌CT检查结果

Figure 1 Computed tomography images of bilateral psoas major muscles at the third lumbar transverse process level

五、统计学分析

应用 SPSS 22.0 统计软件进行分析。正态分布的计量资料以 $\bar{x} \pm s$ 表示,组间比较采用 t 检验;计数资料以绝对数表示,组间比较采用 χ^2 检验;等级资料比较采用 Mann-Whitney U 检验。单因素分析采用 Logistic 回归分析,多因素分析采用 Logistic 逐步回归向后模型。将单因素分析中 $P < 0.20$ 的指标纳入多因素分析。 $P < 0.05$ 为差异有统计学意义。

结 果

一、食管鳞癌患者并发肌少症情况

1 148 例食管鳞癌患者中,469 例并发肌少症,679 例非肌少症,肌少症发生率为 40.854%(469/1 148)。469 例并发肌少症患者中,男 313 例,女 156 例;年龄 < 65 岁、 ≥ 65 岁且 < 70 岁、 ≥ 70 岁且 < 75 岁、 ≥ 75 岁分别为 125、145、106、93 例。

二、食管鳞癌并发肌少症患者与食管鳞癌非肌少症患者的一般资料比较

469 例并发肌少症患者与 679 例食管鳞癌非肌少症患者的年龄、肿瘤长径、BMI、T 分期、术前 Alb、术前血清前白蛋白、PMI 和腰大肌密度比较,差异均有统计学意义($P < 0.05$);两类患者的性别、高血压病史、糖尿病史、吸烟史、肿瘤位置、N 分期和 G 分期比较,差异均无统计学意义($P > 0.05$)。见表 1。

三、食管鳞癌并发肌少症患者与食管鳞癌非肌少症患者的临床结局比较

469 例食管鳞癌并发肌少症患者与 679 例食管鳞癌非肌少症患者的术后住院时间、术后住院时间 > 30 d、肺炎、急性呼吸衰竭、吻合口瘘、心律失常比较,差异均有统计学意义($P < 0.05$)。两类患者的手术时间、术后住院 30 d 内死亡、胸腔积液比较,差异均无统计学意义($P > 0.05$)。见表 2。

表 1 肌少症与非肌少症食管鳞癌患者的临床资料比较

| Table 1 Comparison of clinical data between esophageal squamous cell carcinoma patients complicated with sarcopenia and patients without sarcopenia | | | | | | | | | | | | | |
|---|-----|---------------------------|--|----------------------------|---------------------------------|--------------------------------------|--|--------------------------------|---------------|-----|---------------|------|------|
| 患者类型 | 例数 | 性别(例) | | 年龄 ($\bar{x}\pm s$,岁) | 高血压病史(例) | | 糖尿病史(例) | | 吸烟史(例) | | 肿瘤位置(例) | | |
| | | 男 | 女 | | 有 | 无 | 有 | 无 | 有 | 无 | 食管上段 | 食管中段 | 食管下段 |
| 肌少症 | 469 | 313 | 156 | 68±7 | 343 | 126 | 430 | 39 | 333 | 136 | 55 | 314 | 100 |
| 非肌少症 | 679 | 476 | 203 | 66±7 | 499 | 180 | 622 | 57 | 466 | 213 | 82 | 458 | 139 |
| 统计量值 | | $\chi^2=1.46$ | | $t=-5.74$ | $\chi^2=0.02$ | | $\chi^2=0.01$ | | $\chi^2=0.74$ | | $\chi^2=0.14$ | | |
| P 值 | | 0.227 | | <0.001 | 0.893 | | 0.962 | | 0.390 | | 0.935 | | |
| 患者类型 | 例数 | 肿瘤长径($\bar{x}\pm s$,cm) | 体质量指数($\bar{x}\pm s$,kg/m ²) | T分期(例) | | | N分期(例) | | | | | | |
| | | | | T1期 | T2期 | T3期 | N0期 | N1期 | N2期 | N3期 | | | |
| 肌少症 | 469 | 3.3±1.5 | 22.4±2.9 | 100 | 105 | 264 | 297 | 102 | 54 | 16 | | | |
| 非肌少症 | 679 | 3.2±1.4 | 23.8±3.0 | 173 | 170 | 336 | 435 | 150 | 74 | 20 | | | |
| 统计量值 | | $t=2.11$ | $t=7.57$ | $Z=-2.93$ | | | $Z=-1.09$ | | | | | | |
| P 值 | | 0.035 | <0.001 | 0.003 | | | 0.275 | | | | | | |
| 患者类型 | 例数 | G分期(例) | | | 术前白蛋白 ($\bar{x}\pm s$,g/L) | 术前血清前白蛋白 ($\bar{x}\pm s$,mg/dL) | 腰大肌指数 ($\bar{x}\pm s$,cm ² /m ²) | 腰大肌密度 ($\bar{x}\pm s$,HU) | | | | | |
| | | G1期 | G2期 | G3期 | | | | | | | | | |
| 肌少症 | 469 | 105 | 296 | 68 | 43±4 | 193±38 | 3.9±0.8 | 48±8 | | | | | |
| 非肌少症 | 679 | 148 | 419 | 112 | 44±4 | 206±37 | 6.0±2.2 | 50±7 | | | | | |
| 统计量值 | | $Z=-0.08$ | | | $t=2.25$ | $t=5.52$ | $t=20.36$ | $t=4.18$ | | | | | |
| P 值 | | 0.940 | | | 0.025 | <0.001 | <0.001 | <0.001 | | | | | |

表 2 肌少症与非肌少症食管鳞癌患者的临床结局比较

| Table 2 Comparison of clinical outcomes between esophageal squamous cell carcinoma patients complicated with sarcopenia and patients without sarcopenia | | | | | | | | | | |
|---|-----|--------------------------------|----------------------------------|---------------------|-----------------------|----------------|----------------|----------------|----------------|---------------|
| 患者类型 | 例数 | 手术时间 ($\bar{x} \pm s$, h) | 术后住院时 间($\bar{x} \pm s$, d) | 术后住院 30 d 内死亡(例) | 术后住院时间 $>$ 30 d(例) | 肺炎(例) | 急性呼吸 衰竭(例) | 吻合口瘘 (例) | 心律失常 (例) | 胸腔积液 (例) |
| 肌少症 | 469 | 3.8 \pm 1.0 | 17 \pm 9 | 9 | 32 | 158 | 39 | 33 | 103 | 26 |
| 非肌少症 | 679 | 3.8 \pm 1.0 | 15 \pm 6 | 5 | 15 | 102 | 18 | 19 | 85 | 33 |
| 统计量值 | | $t=0.28$ | $t=4.89$ | $\chi^2=3.20$ | $\chi^2=15.04$ | $\chi^2=55.17$ | $\chi^2=18.86$ | $\chi^2=11.52$ | $\chi^2=18.06$ | $\chi^2=0.27$ |
| P 值 | | 0.781 | < 0.001 | 0.073 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | 0.606 |

四、食管鳞癌患者并发肌少症的影响因素分析
单因素分析结果显示:年龄、T分期、术前 Alb、术前血清前白蛋白、腰大肌密度、BMI 是食管鳞癌患者并发肌少症的影响因素($P<0.05$);性别、高血

压病史、糖尿病史、吸烟史、肿瘤长径、肿瘤位置、N分期、G分期不是食管鳞癌患者并发肌少症的影响因素($P>0.05$)。见表 3。

多因素分析结果显示:年龄 ≥ 65 岁是食管鳞癌

表 3 影响 1 148 例食管鳞癌患者并发肌少症的单因素分析

Table 3 Univariate analysis of sarcopenia in 1 148 esophageal squamous cell carcinoma patients

| 临床病理因素 | 赋值 | <i>b</i> 值 | 标准误 | Wald 值 | 优势比 | 95% 可信区间 | <i>P</i> 值 |
|---------------------------|----|------------|------|--------|------|-----------|------------|
| 性别 | | | | | | | |
| 男 | 0 | | | | | | |
| 女 | 1 | 0.16 | 0.13 | 1.46 | 1.17 | 0.91~1.51 | 0.227 |
| 年龄(岁) | | | | | | | |
| <65 | 0 | | | | | | |
| ≥ 65 | 1 | 0.59 | 0.13 | 20.03 | 1.79 | 1.39~2.32 | <0.001 |
| 高血压病史 | | | | | | | |
| 无 | 0 | | | | | | |
| 有 | 1 | 0.02 | 0.14 | 0.02 | 1.02 | 0.78~1.33 | 0.893 |
| 糖尿病史 | | | | | | | |
| 无 | 0 | | | | | | |
| 有 | 1 | -0.01 | 0.22 | 0.01 | 0.99 | 0.65~1.52 | 0.962 |
| 吸烟史 | | | | | | | |
| 无 | 0 | | | | | | |
| 有 | 1 | -0.11 | 0.13 | 0.74 | 0.89 | 0.69~1.16 | 0.391 |
| 肿瘤长径(cm) | | | | | | | |
| ≥ 3 | 0 | | | | | | |
| <3 | 1 | 0.18 | 0.12 | 2.15 | 1.19 | 0.94~1.51 | 0.143 |
| 肿瘤位置 | | | | | | | |
| 食管上段 | 1 | | | | | | |
| 食管中段 | 2 | 0.04 | 0.11 | 0.13 | 1.04 | 0.84~1.28 | 0.724 |
| 食管下段 | 3 | | | | | | |
| T分期 | | | | | | | |
| T1期 | 1 | | | | | | |
| T2期 | 2 | 0.16 | 0.07 | 4.89 | 1.18 | 1.02~1.36 | 0.027 |
| T3期 | 3 | | | | | | |
| N分期 | | | | | | | |
| N0期 | 0 | | | | | | |
| N+期 | 1 | 0.03 | 0.13 | 0.07 | 1.03 | 0.81~1.32 | 0.798 |
| G分期 | | | | | | | |
| G1期 | 1 | | | | | | |
| G2期 | 2 | -0.07 | 0.10 | 0.50 | 0.93 | 0.77~1.13 | 0.481 |
| G3期 | 3 | | | | | | |
| 术前白蛋白(g/L) | | | | | | | |
| <40 | 0 | | | | | | |
| ≥ 40 | 1 | -0.35 | 0.17 | 4.56 | 0.70 | 0.51~0.97 | 0.033 |
| 术前血清前白蛋白(mg/dL) | | | | | | | |
| <200 | 0 | | | | | | |
| ≥ 200 | 1 | -0.58 | 0.12 | 22.45 | 0.56 | 0.44~0.71 | <0.001 |
| 腰大肌密度(HU) | | | | | | | |
| <48 | 0 | | | | | | |
| ≥ 48 | 1 | -0.33 | 0.12 | 7.14 | 0.72 | 0.57~0.92 | 0.008 |
| 体质量指数(kg/m ²) | | | | | | | |
| ≤ 24 | 0 | | | | | | |
| >24 | 1 | -0.64 | 0.13 | 25.26 | 0.53 | 0.41~0.68 | <0.001 |

患者并发肌少症的独立危险因素,而术前血清前白蛋白 ≥ 200 mg/dL、腰大肌密度 ≥ 48 HU 和 BMI > 24 kg/m² 是食管鳞癌患者并发肌少症的独立保护因素($P < 0.05$)。见表 4。

表 4 影响 1 148 例食管鳞癌患者并发肌少症的多因素分析

Table 4 Multivariate analysis of sarcopenia in 1 148 esophageal squamous cell carcinoma patients

| 临床病理因素 | <i>b</i> 值 | 标准误 | Wald 值 | 优势比 | 95% 可信区间 | <i>P</i> 值 |
|----------|------------|------|--------|------|-----------|------------|
| 年龄 | 0.50 | 0.13 | 13.66 | 1.64 | 1.26~2.14 | <0.001 |
| 术前血清前白蛋白 | -0.45 | 0.13 | 12.67 | 0.64 | 0.50~0.82 | <0.001 |
| 腰大肌密度 | -0.33 | 0.13 | 6.92 | 0.72 | 0.56~0.92 | 0.009 |
| 体质量指数 | -0.63 | 0.13 | 23.03 | 0.53 | 0.41~0.69 | <0.001 |

讨 论

肌少症被认为是机体功能缺陷的一类疾病,在我国 > 65 岁社区老年人群中的比例高达 17.4%^[24]。肿瘤患者由于饮食障碍和(或)肿瘤分解代谢的增加容易并发肌少症^[22,25-26]。已有的研究结果显示:肌少症是多种恶性肿瘤围手术期并发症增加的高危因素,也与患者的远期不良预后密切相关^[16-18,27-29]。PMI 是目前临床常用的反映机体肌肉质量的指标,与住院患者的营养状况及临床不良预后密切相关,被认为是评估肌少症便捷、客观又灵敏的指标之一^[15,23,31]。

食管癌好发于老年患者,常伴有进食障碍,确诊时容易合并不同程度的营养不良^[32-33]。术前营养不良会明显导致食管癌术后并发症增加、住院时间延长等不良临床结局^[34-35]。本研究结果显示:食管癌患者并发肌少症的发生率为 40.854%,与既往研究结果一致^[37]。多因素分析结果显示:年龄 ≥ 65 岁是食管鳞癌患者并发肌少症的独立危险因素;而术前血清前白蛋白 ≥ 200 mg/dL、腰大肌密度 ≥ 48 HU 及 BMI > 24 kg/m² 是食管鳞癌患者并发肌少症的独立保护因素。术前血清前白蛋白及 BMI 是常见代表机体营养状况的指标^[35-41];腰大肌密度是衡量肌肉质量的评价指标,其提示肌少症的发生不仅是骨骼肌面积的减少还包括肌肉质量的变化,可作为 PMI 的补充^[42-43]。

食管癌围手术期并发症的发生率较高,其中术后肺炎和吻合口瘘是食管癌手术常见危重的并发症,具有较高的病死率^[13,44-48]。已有的研究结果显

示:肌少症是食管癌术后肺部并发症和吻合口瘘等并发症的高危因素^[37,49-51]。本研究结果显示:与非肌少症食管鳞癌患者比较,肌少症食管鳞癌患者术后更容易出现肺炎、急性呼吸衰竭、吻合口瘘、心律失常等并发症,并且具有更长的术后住院时间。该结论与既往研究结果一致。推测可能是肌少症患者常伴有营养储备低下、咳嗽排痰能力下降和自主活动降低,加上食管癌手术创伤大、管道多、营养支持困难等缺点的叠加,容易出现上述并发症。

综上,年龄 ≥ 65 岁是食管鳞癌患者并发肌少症的独立危险因素,而术前血清前白蛋白 ≥ 200 mg/dL、腰大肌密度 ≥ 48 HU 和 BMI > 24 kg/m² 是食管鳞癌患者并发肌少症的独立保护因素。与食管鳞癌非肌少症患者比较,食管鳞癌并发肌少症患者术后更易发生肺炎、急性呼吸衰竭、吻合口瘘、心律失常等并发症,且术后住院时间更长。

利益冲突 所有作者均声明不存在利益冲突

作者贡献声明 田文泽、尤振兵、张明志:文献查阅及论文撰写;陈梦舟、冷雪春、徐达夫、徐康:文献查阅,数据统计及分析;徐克平、蒋超、田文泽:研究方案制订,审阅及论文修改

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