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## 超声心动图对慢性收缩性心力衰竭预后的预测价值分析\*

陶 满<sup>1</sup> 吴红宁<sup>1</sup> 曹 怡<sup>1</sup> 杨 慧<sup>1</sup> 黄 进<sup>2</sup> 方爱娟<sup>3</sup>

(1 南京医科大学附属脑科医院(胸科院区)医学影像二科 江苏 南京 210029;

2 南京医科大学附属脑科医院(胸科院区)心血管内科 江苏 南京 210029;

3 南京大学医学院附属鼓楼医院 超声诊断科 江苏 南京 210008)

**摘要 目的:**探讨超声心动图对慢性收缩性心力衰竭(心衰)预后的预测价值。**方法:**选择 2016 年 8 月到 2018 年 9 月在南京医科大学附属脑科医院(胸科院区)医学影像二科(以我院代替)诊治的慢性收缩性心衰患者 112 例,均给予超声心动图检查并记录相关指标,随访患者的预后并进行相关性分析。**结果:**随访至今,112 例患者的主要心血管不良事件(Major Adverse Cardiovascular Events, MACE)发生率为 18.8%。MACE 组患者的左室收缩末期容积(Left ventricular end systolic volume, LVESV)、左室舒张末期容积(Left ventricular end diastolic volume, LVEDV)值显著高于非 MACE 组患者( $P<0.05$ ),两组患者左室收缩末期内径(Left ventricular end systolic diameter, LVDs)、左房内径(Left atrial diameter, LAD)、左心室舒张末期内径(Left ventricular end diastolic dimension, LVDd)值无统计学差异( $P>0.05$ )。患者预后 MACE 与 LVEDV、LVESV 值呈显著相关性( $P<0.05$ )。LVEDV、LVESV 为影响慢性收缩性心衰患者 MACE 的独立危险因素( $P<0.05$ )。**结论:**超声心动图用于慢性收缩性心衰患者可反映患者的心功能状况,且具有较高的预后预测价值。

**关键词:**超声心动图;慢性收缩性心力衰竭;预后;主要心血管不良事件

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## Prognostic Prediction Value of Echocardiography for the Prognosis of Chronic Systolic Heart Failure\*

TAO Man<sup>1</sup>, WU Hong-ning<sup>1</sup>, CAO Yi<sup>1</sup>, YANG Hui<sup>1</sup>, HUANG Jin<sup>2</sup>, FANG Ai-juan<sup>3</sup>

(1 Second Department of Radiology, Nanjing Medical University Affiliated Brain Hospital (Chest Institute), Nanjing, Jiangsu, 210029, China;

2 Department of Cardiology, Nanjing Medical University Affiliated Brain Hospital (Chest Institute), Nanjing, Jiangsu, 210029, China;

3 Department of Ultrasound Diagnosis, Affiliated Drum Tower Hospital of Nanjing University Medical College, Nanjing, Jiangsu, 210008, China)

**ABSTRACT Objective:** To investigate the prognostic prediction value of echocardiography for the chronic systolic heart failure (heart failure). **Methods:** From August 2016 to September 2018, 112 patients with chronic systolic heart failure who were treated in our hospital were enrolled. All patients were given echocardiography and recorded the relevant indicators. The prognosis of patients were followed up and correlation analysis were performed. **Results:** The incidence of major adverse cardiovascular events (MACE) in 112 patients were 18.8%. The LVEDV and LVESV values in the MACE group were significantly higher than those in the non-MACE group ( $P<0.05$ ). There were no significant difference in the LVDs, LVDd, and LAD compared between the two groups ( $P>0.05$ ). The incidence of MACE was significantly related to the LVEDV, LVESV values ( $P<0.05$ ). Multivariate unconditional logistic regression analysis showed that LVEDV and LVESV were independent risk factors for prognosis of MACE ( $P<0.05$ ). **Conclusion:** Echocardiography can reflect the heart function of patients with chronic systolic heart failure, and has great value for the prognostic prediction.

**Key words:** Echocardiography; Chronic systolic heart failure; Prognosis; Major cardiovascular adverse events

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### 前言

心力衰竭简称心衰,其是各种心脏疾病发展的终末阶段。其中,慢性收缩性心衰在临床上主要表现为左心室增大、左心室收缩末期容量增加,其病死率是一般人群的 4-8 倍<sup>[1,2]</sup>。我国当前心衰患者在 500 余万,治疗虽能改善心衰患者的生存率,

但 5 年的病死率很高,临床上需要早期预测,提高其预后<sup>[3,4]</sup>。部分患者的临床表现多样,有或无呼吸困难、乏力和液体潴留(水肿)等症状,导致临床诊断比较困难,预测预后也更加困难<sup>[5,6]</sup>。

当前慢性收缩性心衰的诊断方法比较多,包括胸部 X 光片、CT、核磁共振(Magnetic Resonance Imaging, MRI)<sup>[7]</sup>、心动图、放射性核素检查、超声心动图<sup>[8]</sup>、心衰标志物、心肺运动

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作者简介:陶满(1988-),女,本科,住院医师,研究方向:临床超声,电话:13515103633, E-mail:taoman13515103633@163.com

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实验<sup>[9]</sup>等,其中超声心动图在准确评价心脏功能方面有很好的价值,具有无创、简便的优点<sup>[10,11]</sup>。本研究主要探讨了超声心动图预测慢性收缩性心力衰竭预后的价值,以期改善早期预测,为临床治疗提供参考。

## 1 资料与方法

### 1.1 研究对象

选择 2016 年 8 月到 2018 年 9 月在我院诊治的慢性收缩

性心衰患者 112 例,纳入标准:患者自愿参加;经过医院伦理委员会批准;符合慢性收缩性心衰的诊断标准 (Framingham 标准),心功能分级为 I -III 级;年龄 20-70 岁;临床与随访资料患者完整。排除标准:恶性肿瘤晚期及血液系统疾病者;近期有外科手术史或创伤史者;合并各种病原体感染、自身免疫性疾病、肿瘤者;孕妇、哺乳妇女及半年内可能妊娠者;主动脉夹层者;肺动脉栓塞、先天性心脏病者。两组的一般资料对比差异无统计学意义( $P>0.05$ ),见表 1,有可比性。

表 1 两组一般资料对比

Table 1 Comparison of general data between the two groups

| Groups         | n  | Gender<br>(Male/<br>Female) | Primary disease (dilated<br>cardiomyopathy /<br>rheumatic heart disease /<br>hypertensive heart<br>disease) | Age(old)    | BMI(kg/m <sup>2</sup> ) | SBP(mmHg)     | DBP(mmHg)    | Heart function<br>classification<br>(Class I/II/III) |
|----------------|----|-----------------------------|-------------------------------------------------------------------------------------------------------------|-------------|-------------------------|---------------|--------------|------------------------------------------------------|
|                |    |                             |                                                                                                             |             |                         |               |              |                                                      |
| MACE Group     | 21 | 11/10                       | 8/5/4/2                                                                                                     | 56.21± 2.85 | 22.84± 1.48             | 148.24± 13.22 | 94.28± 15.02 | 8/9/4                                                |
| Non-MACE group | 91 | 45/46                       | 45/22/16/8                                                                                                  | 55.87± 3.17 | 22.14± 3.11             | 146.28± 12.47 | 93.01± 12.48 | 43/38/20                                             |

### 1.2 超声心动图检查方法

选择飞利浦 VividE9 彩色多普勒超声诊断系统,探头频率为 2-4 HMz,扫描部位包括胸骨左缘、胸骨旁短轴、二腔心、心尖、二尖瓣、心尖四腔等。测定 LVDs、LAD、LVDd、LVESV、LVEDV 等指标。

### 1.3 调查内容

患者的病史,基础资料(如超声心动图、性别、收缩压、舒张压、心功能分级等)。所有患者随访调查至今,以患者出现恶性心律失常、脑卒中、心源性死亡、再次心衰、再发冠脉事件等主要心血管不良事件 (Major Adverse Cardiovascular Events, MACE)为观察预后的指标。

### 1.4 统计学分析

数据选择 SPSS22.00 进行统计学分析,计量资料以( $\bar{x} \pm s$ )表示,计数数据以%表示,分别采用 t 检验与  $\chi^2$  分析,以  $P<0.05$  差异有统计学意义。

## 2 结果

### 2.1 预后情况

随访至今,平均随访时间为 8.14± 2.18 个月,112 例患者的恶性心律失常、脑卒中、心源性死亡、再次心衰、再发冠脉事件等 MACE 发生率为 18.8%(21/112)。

### 2.2 超声心动图指标对比

MACE 组的 LVEDV、LVESV 值显著高于非 MACE 组 ( $P<0.05$ ),而其他指标无统计学差异( $P>0.05$ )。见表 2。

表 2 两组心功能指标对比( $\bar{x} \pm s$ )

Table 2 Comparison of the cardiac function indicators between the two groups( $\bar{x} \pm s$ )

| Groups         | n  | LVEDV(mL)      | LVESV(mL)     | LVDs(cm)   | LVDd(cm)   | LAD(cm)     |
|----------------|----|----------------|---------------|------------|------------|-------------|
| MACE Group     | 21 | 107.33± 22.19* | 49.20± 11.49* | 3.69± 0.83 | 5.11± 0.44 | 37.11± 2.19 |
| Non-MACE group | 91 | 97.20± 13.10   | 41.02± 5.66   | 3.93± 0.44 | 5.16± 0.44 | 38.21± 3.10 |

Note: compared with the Non-MACE group, \* $P<0.05$ .

### 2.3 相关性分析

在 112 例患者中,预后 MACE 与 LVEDV、LVESV 值成相

关相关性( $P<0.05$ )。见表 3。

表 3 慢性收缩性心衰患者的预后 MACE 与超声心动图指标的相关性(n=112)

Table 3 Correlation between prognosis MACE and echocardiographic parameters in patients with chronic systolic heart failure (n=112)

| Index | r     | P     |
|-------|-------|-------|
| LVEDV | 0.326 | 0.025 |
| LVESV | 0.388 | 0.009 |

### 2.4 多因素分析

在 112 例患者中,以预后 MACE 为因变量,一般资料、超声心动图指标等为自变量,Logistic 回归分析显示 LVEDV、

LVESV 为影响预后 MACE 的独立危险因素( $P<0.05$ )。见表 4。

## 3 讨论

表 4 影响慢性收缩性心衰患者预后 MACE 的多因素分析(n=112)

Table 4 Multivariate analysis of prognostic MACE in patients with chronic systolic heart failure (n=112)

| Index | B     | SE    | Wald  | P     | OR    | 95%CI       |
|-------|-------|-------|-------|-------|-------|-------------|
| LVEDV | 0.861 | 0.428 | 4.071 | 0.044 | 2.366 | 1.025-5.465 |
| LVES  | 0.680 | 0.337 | 4.079 | 0.043 | 1.976 | 1.029-3.822 |

慢性收缩性心衰是当今社会人类死亡的主要原因之一,是各种心血管疾病的终末阶段,其病死率是一般人群的 4-8 倍,对慢性收缩性心衰患者进行早期鉴别诊断与预后预测已是临床工作研究的重点<sup>[12,13]</sup>。本研究随访两年,发现 112 例患者的 MACE 发生率为 18.8%,表明慢性收缩性心衰的预后比较差,与其他研究的 20%左右类似<sup>[14]</sup>。

慢性收缩性心衰患者多伴随有基础心脏病的病史、症状及体征,胸部 X 光片与心衰标志物在临床应用中比较常见,但是诊断特异性有待提高<sup>[14]</sup>。超声心动图可依靠一系列电子技术,测量高速血流的能力,采用一定容积血流的频谱图,反映心功能状况<sup>[15]</sup>。该方法评价慢性收缩性心衰的心功能具有客观、准确、简便易行、可重复操作等优势<sup>[16]</sup>。本研究显示 MACE 组的 LVEDV、LVESV 值显著高于非 MACE 组,两组 LVDs、LVDd、LAD 值对比差异无统计学意义。从机制上分析,慢性收缩性心衰患者在长期的病理因素影响下,心排出量难以维持,最终会导致失代偿心衰<sup>[17]</sup>。

慢性收缩性心衰患者有着极高的的致病、致死和致残率,虽然当前的诊治策略从关注短期血流动力学改善转而针对防止和延缓重构而发展,但是其病死率一直比较高,严重降低了人们的生活质量<sup>[18]</sup>。该病在临床上可表现为心绞痛、心肌梗死、心律失常、心源性猝死等,特别是老年患者更易出现心脏结构改变<sup>[19]</sup>。研究发现炎症因子、神经内分泌障碍等在心衰的发病机制中有重要意义<sup>[20,21]</sup>。早期检出心脏结构异常或功能障碍情况,能有效指导临床治疗,从而改善患者预后<sup>[22,23]</sup>。特别是随着病情的发展,患者有心肌回声变强、变薄的特点,通过超声心动图测可以鉴别与诊断本病<sup>[24]</sup>。并且超声心动图不受患者主观影响,更能客观反应患者心功能的实际状况,有利于预测预后<sup>[25]</sup>。本研究直线相关分析显示患者预后 MACE 与 LVEDV、LVESV 值成相关相关性。多因素非条件 Logistic 回归分析显示 LVEDV、LVESV 为影响预后 MACE 的独立危险因素。但超声心动图应用时对体积较大左室的测量还缺乏一定的准确度,在后续的研究中重点将研究其准确性和敏感性。

总之,超声心动图用于慢性收缩性心衰患者可反映患者的心功能状况,且具有较高的预后预测价值。

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