

论著

## BRL 37344急性用药对心力衰竭大鼠血流动力学和 $\beta$ 肾上腺素受体表达的影响

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**摘要** 目的 观察心力衰竭大鼠急性给予 $\beta_3$ 肾上腺素受体 ( $\beta_3$ -AR) 激动剂BRL 37344是否与慢性给药一样, 使 $\beta_3$ -AR表达进一步增加, 心脏功能进一步恶化。方法 大鼠sc异丙肾上腺素 (Iso, 340 mg·kg<sup>-1</sup>, 2次, 间隔24 h) 制备心衰模型。8周后静脉给予BRL 37344 0.4 nmol·kg<sup>-1</sup>·min<sup>-1</sup>, 10 min, 测定给药后0, 10, 30 min, 1, 2, 3 h, 1, 2和7 d 的血流动力学变化; 逆转录聚合酶链反应方法测定0, 1, 2和7 d 的心肌组织 $\beta$ -AR mRNA水平。**结果** 与Iso模型组 相比, Iso+BRL组注射BRL 37344后1~3 h 心率、+dp/dt<sub>max</sub>和左室收缩末压明显增加, 左室舒张末压明显降低, 之后恢复至注射BRL 37344前水平。与正常对照组相比, BRL组注射BRL 37344后 $\beta_1$ ,  $\beta_2$ 和 $\beta_3$ -AR水平变化不明显, Iso组 $\beta_1$ -AR mRNA水平明显降低,  $\beta_3$ -AR mRNA水平明显上升。Iso+BRL组注射BRL 37344后d 2起,  $\beta_1$ -AR mRNA水平较Iso组进一步降低,  $\beta_3$ -AR mRNA进一步上升, d 7 时变化更明显。**结论** BRL 37344急性用药对衰竭心脏血流动力学有短暂的改善作用, 但与慢性给药同样使衰竭心脏 $\beta_1$ -AR mRNA水平下降和 $\beta_3$ -AR mRNA水平上升, 这有可能导致心脏功能的恶化。

**关键词** [受体,肾上腺素, \$\beta\$  基因表达](#) [心力衰竭](#) [BRL 37344](#)

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## Effects of acute injection of BRL 37344 on hemodynamics and $\beta$ -adrenoreceptors expression in myocardium of rats with heart failure

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### Abstract

**AIM** To observe whether acute stimulation of BRL 37344, a  $\beta_3$ -adrenergic receptor ( $\beta_3$ -AR) agonist, has the same effects of exacerbating hemodynamics and increasing in  $\beta_3$ -AR expression on rats with failing heart as chronic administration.

**METHODS** Rats received two doses of isoprenaline (Iso, 340 mg·kg<sup>-1</sup>, sc, with a 24 h interval) to prepare heart failure model. After 8 weeks, rats were given iv BRL 37344 0.4 nmol·kg<sup>-1</sup>·min<sup>-1</sup> for 10 min. Hemodynamics were measured at 0, 10, 30 min, 1, 2, 3 h, 1, 2 and 7 d after BRL 37344. Levels of  $\beta$ -AR mRNA in myocardium were measured at 0, 1, 2 and 7 d after BRL 37344 by reverse transcription-polymerase chain reaction. **RESULTS** Compared with Iso group, heart rate, left ventricular end systolic pressure and +dp/dt<sub>max</sub> were significantly higher, and left ventricular end diastolic pressure was significantly lower during 1-3 h after BRL 37344 injection in Iso+BRL group. Then, they were restored to the same level as that prior to BRL 37344 injection. Compared with normal control, the levels of  $\beta_1$ -,  $\beta_2$ - and  $\beta_3$ -AR mRNA displayed no significant change in BRL group; the level of  $\beta_1$ -AR mRNA was lower and the level of  $\beta_3$ -AR mRNA was higher in Iso group. In Iso+BRL group, much more lower  $\beta_1$ -AR mRNA level and much higher  $\beta_3$ -AR mRNA level were shown on d 2 and d 7 than Iso group. **CONCLUSION** Acute administration of  $\beta_3$ -AR agonist has a shorter improved hemodynamics. But it caused the same result as chronic administration in reduction of  $\beta_1$ -AR mRNA and increment of  $\beta_3$ -AR mRNA in failure hearts, which may aggravate the cardiac functions.

**Key words** [receptors](#) [adrenergic](#)  [\$\beta\$](#)  [gene expression](#) [heart failure](#) [BRL 37344](#)

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