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Chronic vagal nerve stimulation suppress thirst through decreasing vasopressin secretion in the rats with chronic heart failure

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Topic(s):
Devices for Autonomic Modulation

Citation:

Introduction

Chronic right cervical vagal nerve electric stimulation (VS) exerted prognostic benefits in heart failure rats. Exploring the mechanism is significant for clinical application. This study examined the effect of VS on arginine vasopressin (AVP) secretion and drinking behavior in the rats with chronic heart failure.

Methods

After a week recovery of myocardial infarction (MI), surviving rats after were randomly instrumented to VS group and sham stimulation (SS) group. A drop sensor was used to record real-time fluid consumption. Blood samples were collected weekly from the 3rd week during the 6 weeks treatment.

Results

Vagal stimulation did not change the daily fluid consumption (Mean ± SE, 76.2 ± 1.1 vs. 77.8 ± 2.1 ml/kg/day, n=6, P<0.05). Thirst, which is defined as per drinking volume (PDV), significantly increased during the early weeks after MI (Fig A), while VS significantly suppressed PDV (Fig B is the data of 6th week) by increasing the drinking intervals. The level of plasma AVP was increased to about 2 fold during 6 weeks observation in the SS group, however, VS suppressed this upregulation (Fig C).

Conclusion

These results suggest that VS may activate vagal afferent components which related to inhibition of AVP secretion and then suppressed the augmentation of thirst. Frequent drinking small volume may benefit for homeostasis in CHF.
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