

# **Value of Heart Rate Control in Management of Patients with Severe Sepsis and Septic Shock**

*Thesis*

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**Critical Care Medicine**

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

# قالوا

سبّحانك لا علم لنا  
إلا ما علمتنا إنك أنت  
العليم العظيم

صدق الله العظيم

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## ABSTRACT

**Introduction:** A heart rate higher than 90beats/min indicates an unfavorable prognosis for patients with sepsis with MODS and septic shock. We sought to investigate the effect of the pacemaker current (If) inhibitor Ivabradine on heart rate, hemodynamics, and disease severity among patients with sepsis with multi organ dysfunction syndrome and /or septic shock.

**Patients and Methods:** In this prospective, controlled, randomized, 50 patients with sepsis with multi organ dysfunction syndrome and /or septic shock and a sinus rhythm of at least 90beats/min, were divided into two groups, 25 patients received the conventional treatment with Ivabradine (5mg twice daily) via the enteral route and 25 patients received the conventional treatment. The primary outcome was the percentage of patients with a heart rate reduction of at least 10beats/min after 96h. Secondary outcomes included the effect of Ivabradine on hemodynamics, disease severity, vasopressor use, mortality, and adverse events.

**Results:** After 72 h from ICU admission the daily mean heart rate was reduced by 22 beats/min(from 118 to 96 beats/min) in the control group and by 29 beats/min in the Ivabradine group(from 117 to 88 beats/min) ( $P = 0.046$ ). After 96h, the daily mean heart rate was reduced by 24 beats/min(from 118 to 94 beats/min) in the control group and by 33 beats/min(from 117 to 84 beats/min) in the Ivabradine group ( $P = 0.023$ ). No differences in secondary outcomes were observed.

Ivabradine had an impact on diastolic function. There was significant improvement in diastolic function at least one grade from base line ( $P = 0.038$ ).

**Conclusion:** Use of enteral Ivabradine can reduce elevated heart rate and improve diastolic function in septic patients but it had no impact on overall survival, length of ICU stay, or days on mechanical ventilation, vasopressors or renal replacement therapy.

**Key words:** Septic shock, Heart rate, Ivabradine, Multi organ dysfunction syndrome, Mortality.