Intravenous ivabradine in low cardiac output syndrome (LCOS) treated by dobutamine after CABG surgery

- Objectives:
  - Assess the effect of i.v. ivabradine versus placebo in coronary artery disease patients presenting a LCOS following a planned (coronary artery bypass graft) CABG and requiring dobutamine administered as first line inotropic therapy
  - Confirm that the efficacy of the inotropic treatment on hemodynamics is not altered when associated with ivabradine
- Endpoints:
  - Primary: proportion of patients who decreased their heart rate (HR) between 80 and 90 bpm
  - Secondary: variation of hemodynamics and biomarkers at
- Design:
  - Multicenter, randomized, placebo-controlled trial, phase II
- Inclusion:
  - 19 patients with LCOS, who developed sinus tachycardia above 120 bpm after dobutamine initiation, after CABG surgery

L.S. Nguyen et al. Crit Care. 2018 Aug 17;22(1):193.

Results

The primary endpoint was reached in 13 out of 14 (93%) patients of the ivabradine group and in 2 out 5 (40%) of the placebo group.

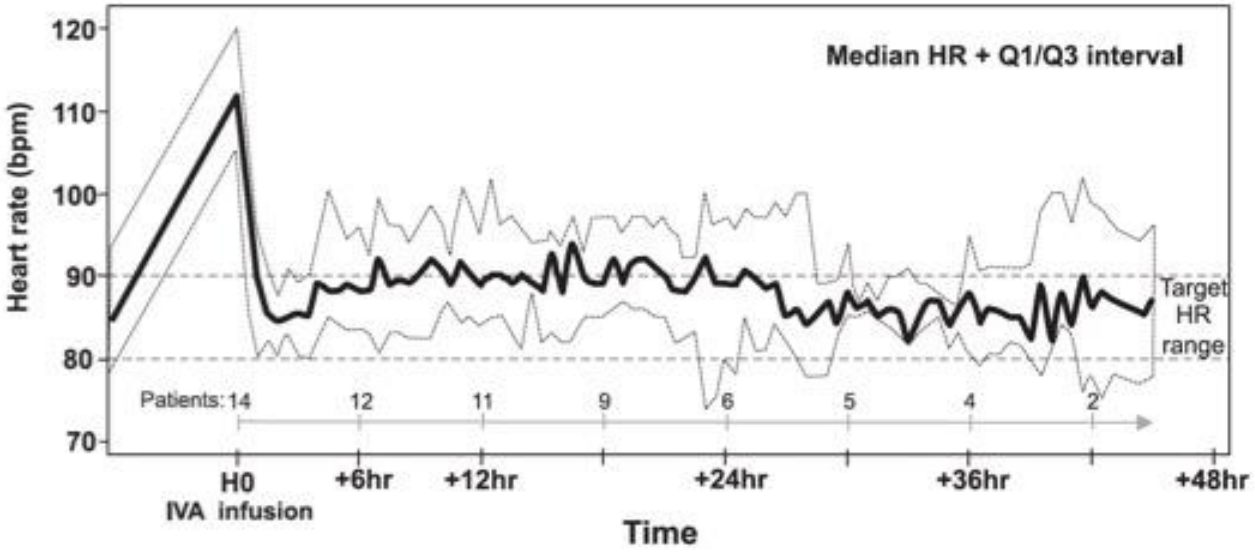

Figure 1. Heart rate variations in the ivabradine group.
HR: heart-rate; Q1: quartile 1; Q3: quartile 3; IVA: ivabradine

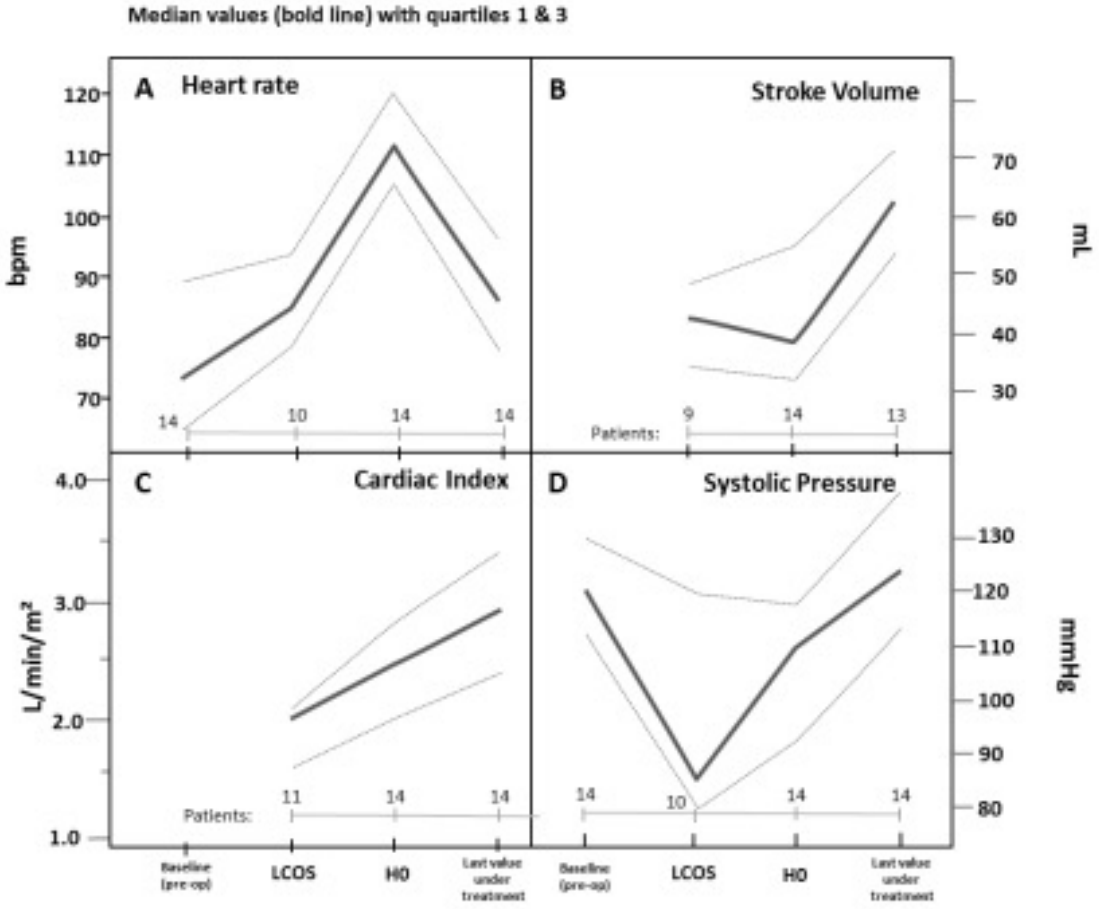

Figure 2. Hemodynamic variations in the ivabradine group (n=14) between inclusion (pre-op), dobutamine initiation (LCOS), ivabradine initiation (H0) and cessation (last value under treatment). A) heart rate (bpm); B) stroke volume (mL); C) cardiac index ($L.min^{-1}.m^{-2}$) and D) systolic pressure (mmHg).

L.S. Nguyen et al. Crit Care. 2018 Aug 17;22(1):193.

Results & Conclusion

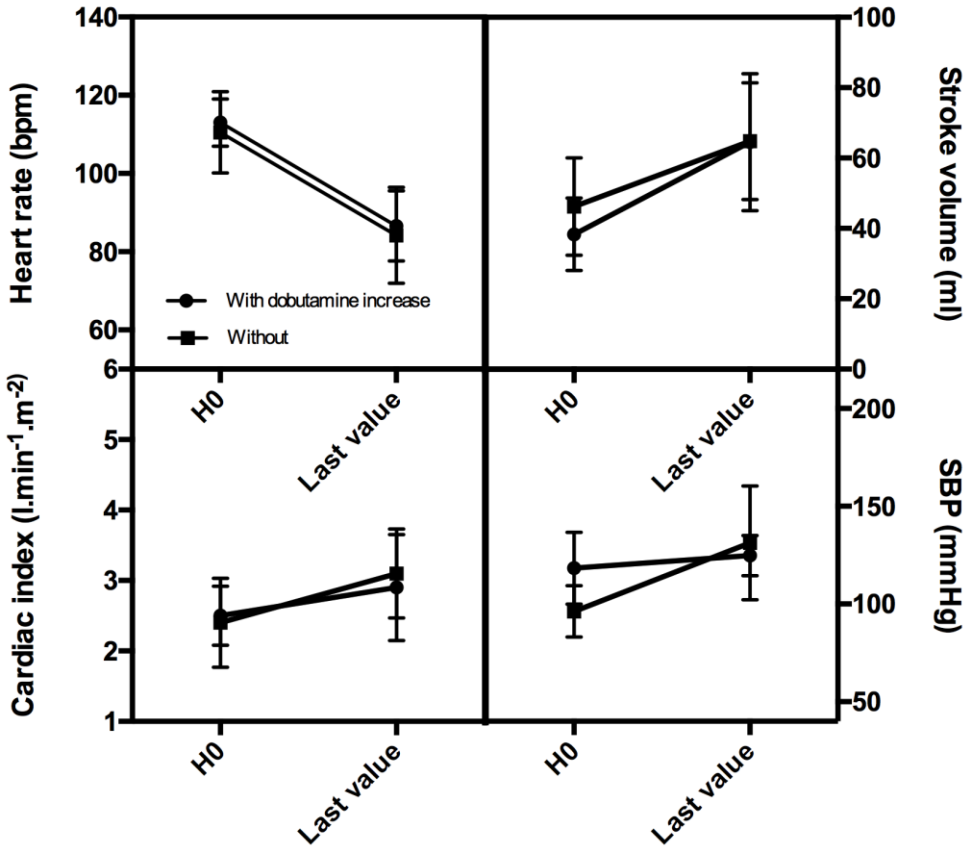

Figure 3. Comparison of hemodynamic effects of intravenous ivabradine between study treatment initiation (H0) and cessation, in the ivabradine group, with dobutamine increase (n=6) and without dobutamine increase (n=8).

- This exploratory study showed that in a specific population of patients, with dobutamine-induced tachycardia after elective CABG, the administration of i.v. ivabradine significantly and quickly reduced HR without impairing cardiac output and arterial blood pressure.
- Larger studies would be necessary to better assess the overall hemodynamic effects of i.v. ivabradine alone or associated with dobutamine.

L.S. Nguyen et al. Crit Care. 2018 Aug 17;22(1):193.