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Introduction:
The cardioprotective effects of levosimendan could be related to the modulation of oxidative balance. We aimed to examine the effects of levosimendan in patients with cardiogenic shock or with ejection fraction (EF) lower than 30% on cardiac systo-diastolic function and plasma oxidants/antioxidants (glutathione, GSH; thiobarbituric acid reactive substances, TBARS).

Methods:
In 4 patients undergone coronary artery bypass grafting or angioplasty, cardiovascular parameters were measured at T0 (before the beginning of levosimendan, 0.1mcg/Kg/min), T1(1 h after the achievement of the therapeutic dosage of levosimendan), T2 (at the end of levosimendan infusion), T3 (at 72 h after the end of levosimendan infusion), T4 (at the end of cardiogenic shock). The same time-course was followed for plasma GSH and TBARS measurements.

Results:
We found an improvement in cardiac output, cardiac index and systolic arterial blood pressure. EF increased from mean 25% to 45%. A reduction of central venous pressure and wedge pressure was also observed. Moreover, indices of diastolic function were improved by levosimendan administration (E/E’ from 14 to 6; E/A from >1 to <1) at early T2. It is to note that an improvement of GSH and TBARS was observed early after levosimendan administration (T1), as well (Figure 1).

Conclusion:
The results obtained have shown that levosimendan administration can regulate oxidant/antioxidant balance as an early effect in low cardiac output patients. The modulation of oxidative condition could be speculated to play a role in exerting the cardio-protection exereted by levosimendan in those patients.

Image:
Effects of levosimendan on cardiac output (CO), cardiac index (CI), glutathione (GSH) and malonyldialdeide (MDA, which is representative of thiobarbituric acid reactive substances (TBARS)). * p<0.05 vs T0. Square brackets indicate significance between groups (p<0.05)