

# **STUDY OF DIASTOLIC FUNCTION WITH TEE IN PATIENTS UNDERGOING MYOCARDIAL REVASCULARIZATION: EVALUATION BEFORE AND AFTER CARDIOPULMONARY BYPASS. MODIFICATION OF E/A RATIO CAN BE CONSIDERED A PRELOAD INDEX?**

C. Manganelli\*, C. Crespini\*, M. Iaconi\*, F. Piscioneri\*, L. Tritapepe\*.

\*Department of Cardiovascular, Respiratory, Nephrological, Anesthesiological, and Geriatric Sciences, Policlinico Umberto I-Sapienza University of Rome, 00161 Rome, Italy.

## ***BACKGROUND AND OBJECTIVES:***

Among patients undergoing cardiac surgery for coronary artery disease or aortic stenosis our echo (TEE) study showed significant but reversible changes of diastolic indices after cardiopulmonary bypass (CPB).

## ***METHODS:***

We enrolled 30 patients undergoing elective CABG surgery, and we assessed the diastolic function (DF) with TEE before and after CPB. TEE derived measures of diastolic dysfunction included early to late transmitral Doppler inflow velocity ratio (E/A), deceleration time (DcT), pulmonary venous systolic to diastolic Doppler velocity ratio (S/D).

We established four times:

- T0: after sternotomy (after 10 minutes of haemodynamic stabilization)
- T1: after fluid challenge of 250 ml of gelofusine, before cannulation for the CPB
- T2: after 20' the end of the CPB
- T3: after chest closure

## ***RESULTS:***

We observed that the E/A ratio, the S/D ratio, the PVADur, the C.I. and SVRI changes very significantly.

We have identified two groups in the starting survey:

- A) responders to volemic fill (R): the E/A ratio increased between T0-T1 ( $p < 0.03$ ) with the infusion of gelofusine. These patients didn't require inotropic drugs support for weaning from CPB.
- B) non-responders to volemic fill (NR): the E/A ratio didn't increase between T0-T1 ( $p < 0.03$ ), even though the infusion of gelofusine, and in addition these patients required inotropic drugs support for weaning from CPB.

## ***CONCLUSIONS:***

After the CPB it could see worsening of diastolic function of the left ventricle with reduction of E/A ratio and of S/D ratio comparing times (values) pre CPB with times (values) post CPB. We also observed a parameter of optimization explored (progressive normalization DcT) comparing before (T0) and after (T3) the CPB mimicking a future improvement of the DF and a statistically significant improvement ( $p < 0.01$ ) of the CI in measurements before and after the CPB and a reduction of SVRI.

The E/A ratio of patients (R), increased between T0-T1 indicating an overall improvement in diastolic parameters, while this ratio didn't increase among patients (NR), indicating a failing of improvement.

This probably is due to inotropic drug used and this suggests that the failing to respond to ventricular filling before the CPB could be used as a predictor, to assess which patients would benefit from inotropic support for the weaning from the CPB.

*TABLE 1- Test TStudent data comparison*

Var.	T0 – T1		T0 – T2		T0 – T3	
	(media±DS)	t (p<)	(media±DS)	t (p<)	(media±DS)	t (p<)
E/A	(0,23±0, 26)	4,94 (0,01)	(-0,51±0,26)	-0,42 (n.s.)	(-0,11±0,36)	-1.62 (n.s.)
S/D	(-0,05±0,26)	-1,13 (n.s.)		-2,85 (0,05)	(-0,20±0,42)	-2,43 (0,05)
DcT	(-0,003±0,08)	0,21 (n.s.)	(-0,60±0,10)	-3,07 (0,01)	(-0,63±0,11)	-2,72 (0,01)
PVADur	(0,007±0,03)	1,08 (n.s.)	(-0,019±0,03)	-3,21 (0,01)	(-0,07±0,02)	-1.4 (n.s.)

*TABLE 2- Data comparison between group responders to volemic fill (R) and group non-responders to volemic fill (NR)*

	Responders T0-T1	Non responders T0-T1	
variable	(media±DS)	(media±DS)	Sign (p<)
E/A	(0,298±0,264)	(0,043±0,149)	(0,033)
S/D	(0,0005±0,259)	(-0,158±0,211)	(0,17) n.s.