16th World Congress of Arrhythmias 2-4 November, 2019 - Buenos Aires, Argentina

## RESYNCRHONIZATION THERAPY RESPONDERS GUIDED BY NON-INVASIVE ELECTRICAL SYNCHRONY METHOD

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**Introduction:** Cardiac resynchronization therapy (CRT) has emerged as an important treatment for heart failure patients with reduced ejection fraction (EF) despite optimal pharmacological therapy. Non-responders rate near 30% has showed in some studies. There is currently no gold standard method for the selection, evaluation and follow up on this group of patients. Multiple techniques used and operator dependence made echocardiogram failed.

Synchromax 2 is a device designed to evaluate non-invasive electrical synchrony. It is fast, reproducible and not dependent operator. Synchromax was evaluated and correlated with other techniques in previous studies.

**Objective:** Evaluate CRT response rate guided by electrical synchrony during the device implantation and follow up.

**Material and methods:** 38 patients were evaluated in an institution in Buenos Aires. A ICD-CRT was implanted in all patients due dilated cardiomyopathy, low EF (less than 35%) and left bundle branch block (LBBB). Non-invasive electrical synchrony evaluation (Synchromax 2) was performed in all patients in baseline condition, during device implantation and the follow up. Synchrony index and curves were analyzed. Curve type 4 and index between 0,4 and 0,7 were considered synchronous. Curve type 6 and 10 and index more than 0.7 were considered disynchronous. Interventricular intervals were modified to achieve the best curve and synchrony index. Super responders were considered when EF increased >50%. Baseline and 6 month after implantation echocardiogram were performed.



	Patients (n=38)
Gender	
Males	65% (n=24)
Females	14% (n=14)
Age	61,6 years old
Etiology	
Dilated Cardiomyopathy	63% (n=23)
Chagas disease	8% (n=4)
Hypertrophic Cardiomyopathy	19% (n7)
Congenital Disease	5% (n=2)
Others	5% (n=2)
Ejection Fraction (%)	26%
Most frequent curve	Type 6 (55 <i>,</i> 2%)
Index >0,7	73,3%
EF increased average	37%(îî11%)
Super responders rate	18,4% (n=7)



**Baseline clinical characterisctics** 

	Type 4 curve (n=24)	Non-type 4 curve (n=14)
EF	22%	30%
baseline		
EF follow	40%	34%
up		

Follow up EF increased. Comparison betwen synchronous group (type 4 curve achieved) and dysynchronous group (non-type 4 curve achieved).

Synchromax method shows different types of curves which are divided into three groups: Synchronous (index value betwen 0 and 0.4); intermediate (index value betwen 0.41 and 0.7); and dysynchronous (index value betwen 0.71 and 1). A type 2 curve is for parahisian stimulation.



Synchromax device used to measure non-invasive electrical disynchrony



Non-invasive electrical evaluation in a responder patient. Interventricular intevals are modified in order to achieve a type 4 curve with a index less than 0,7. Best curve was achieved with RV first 20 msec.

Non-invasive electrical evaluation in a non-responder patient. Interventricular intevals are modified in order to achieve a type 4 curve with a index less than 0,7. In this case type 4 curve was not achieved.

**Conclusion:** Electrical synchrony evaluation using Synchromax 2 during ICD-CRT device implantation improves responders rate. When synchronous type 4 curve is achieved EF improves significantly. If type 4 curve is not found results will be unsuccessfully. Synchromax is fast, simple and non-operator dependent.

