

# Potential value of the low frequency/high frequency ratio of heart rate variability to guide atrial fibrillation ablation procedures

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## Topic(s):

Rhythm Control, Catheter Ablation

## Background.

The differentiation between vagally and non-vagally mediated atrial fibrillation (AF) could be useful to decide adding ganglionated plexi ablation (GPA) to pulmonary vein isolation (PVI) in patients with vagally mediated AF onset.

The role of the autonomic nervous system in triggering paroxysmal AF can be analyzed through heart rate variability (HRV) parameters. The low frequency/high frequency ratio (LF/HF) is used as an index of sympatho-vagal interaction. Based on clinical criteria, values of LF/HF <1.5 are considered to reflect an increase of vagal modulation.

## Purpose

Identify patients with paroxysmal AF who may benefit from GPA in addition to PVI, based on analysis of HRV parameters

## Material and methods

From our database of unselected Holter recordings containing paroxysmal AF episodes, 199 analyzable AF onsets were labelled. We analyzed HRV frequential parameters by segments every 300 RR intervals to identify adrenergic and vagal onsets of AF episodes. We categorized AF onsets, depending of their respective values of LF/HF. We also checked the relationship of these parameters to heart rate (HR). We followed the evolution of the mean normalized values of LF/HF from the beginning of the recordings to the AF onsets (see figure).

## Results

We found a progressive increase of LF/HF in normalized units (mean [95% confidence interval]) from 2.44 [2.12-2.76] to 3.12 [2.85-3.39] in the adrenergic group (n=113) and a progressive decrease of LF/HF from 1.51 [1.28-1.75] to 1.02 [0.95-1.09] in the vagal group (n=86). Differences between adrenergic and vagal AF were highly significant using Mann-Whitney test (p<0.001). A given patient shows the same type of AF in 80% of cases. We found no correlation between frequential parameters and HR.

## Conclusions

Our data show potential added value of frequential HRV analysis to guide additional ganglionated plexi ablation to PVI. This remains to be demonstrated in a prospective study. The ratio LF/HF should be considered to optimize the decision-making process for the ablation procedure.

