

Should we adjust QRS duration to BMI and BSA to predict Cardiac Resynchronization Therapy response?

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INTRODUCTION

- Current Guidelines established a class I indication for Cardiac Resynchronization Therapy (CRT) implantation in symptomatic heart failure patients with QRS duration greater than 150ms and complete left branch block.
- It is known that QRS duration is influenced by weight and height, but it remains unclear if the adjustment of the QRS to these parameters can help to better select patients who respond to CRT.

AIM: To analyze if the QRS adjusted to body mass index (BMI) and body surface area (BSA) could predict CRT response in patients with QRS < 160ms.

METHODS

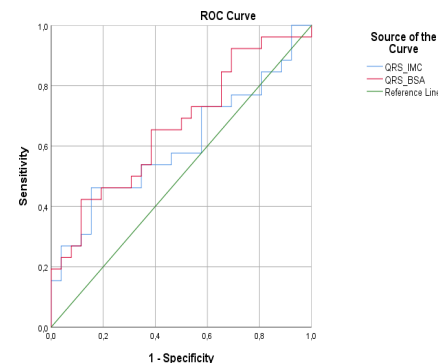
- Single-center retrospective study of consecutive patients with QRS < 160ms submitted to CRT implantation between 2016 and 2019.
- A total of 53 CRT recipients were analyzed to assess response to CRT at 12 months of implantation based on echocardiographic criteria (responders defined as: increase of ejection fraction $\geq 10\%$ or left ventricle end-systolic volume reduction $\geq 15\%$). Baseline QRS duration was adjusted to BMI (QRS/BMI) and BSA (QRS/BSA) to create and compare the best QRS index to predict CRT response compared to non-adjusted QRS.
- The results were obtained using Mann-Whitney test and linear regression. The best cut-off for QRS/IMC and QRS/BSA index was defined using the area under the ROC curve (AUC). The significance between AUC was calculated using NCSS software.

RESULTS

- Fifty-three patients were included (72% males, mean age 72.1 ± 9.8 years), of which 26 patients (49%) responded to CRT.
- The mean QRS/BSA index was higher in CRT responders compared to non-responders (82.56 ± 2.74 versus 75.34 ± 1.70 , $p=0.04$). There was a positive linear correlation between QRS/BSA index and response to CRT ($r=0.302$, $p=0.03$). QRS/BSA index of 64.32 was the best cut-off to predict CRT response (AUC 0.66, sensitivity 96%, specificity 85%, $p=0.044$).

RESULTS

- Regarding the QRS/IMC index, there was no difference between CRT responders and non-responders (5.82 ± 0.25 and 5.29 ± 0.12 , $p=0.194$). The best QRS/IMC cut-off to predict CRT response was 4.34 (AUC 0.61, sensitivity 96%, specificity 85%, $p=0.194$)
- The difference between AUC of QRS/BSA and QRS/IMC index was statistically significant ($p=0.04$).



CONCLUSIONS

- Indexing the QRS to the BSA improves patient selection for CRT implantation and this index should be considered as a novel indicator to predict the response to CRT. There is still need further studies to validate this data.