Management of Tachycardia Mediated Cardiomyopathy: Experience from the Vancouver General Hospital Cardiac Function Clinic: TMC-EXPLOR

Aliya Daulat, BSc(Pharm), PharmD; Jenny MacGillivray, BSc (Pharm), ACPR; Margaret Sidsworth, BSc (Pharm), ACPR; Ricky D. Turgeon, BSc (Pharm), ACPR, PharmD

Background

- Tachycardia-mediated cardiomyopathy (TMC) is a form of reversible heart failure with reduced ejection fraction (HFrEF).
- TMC is caused by persistent tachyarrhythmias, most commonly atrial fibrillation (AF) and atrial flutter (AFL).
- The current management approach is to use guideline directed medical therapy (GDMT) for HFrEF & rate or rhythm control for the associated arrhythmia.
- TMC patients are underrepresented in clinical trials that established GDMT. Observational studies yielded conflicting results regarding the superiority of rate or rhythm control.

Objective

- To describe the pharmacological and non-pharmacological management patterns of HFrEF & atrial arrhythmias in patients with TMC in a specialty heart failure clinic.

Methods

- **Design**: Retrospective observational single-site chart review.
- **Sample size**: TMC patients at Vancouver General Hospital's Cardiac Function Clinic from Oct 2018 to Oct 2019.
- **Inclusion Criteria:** Adults with HFrEF, physician-determined diagnosis of TMC as HFrEF etiology.
- **Outcomes:**
  - Co-primary outcomes:
    - Proportion (%) of patients on GDMT for HFrEF. GDMT is defined as combination ARNI + beta blocker + MRA at any dose. Alternatively, ACEI/ARB may be used in place of ARNI if LVEF is >40% at 1 year.
    - % received/ordered rhythm control within 1 year.
  - Secondary outcomes:
    - Proportions of patients receiving target dose or any dose of ACEI/ARB, ARNI, beta blocker, MRA.
    - Proportion of patients undergoing catheter ablation, pharmacological rhythm control with amiodarone, or direct current cardioversion (DCCV) at 1 year.
- **Analysis:** Descriptive statistics using Microsoft Excel 2020. Change in LVEF is tested using Wilcoxon signed rank test.

Results

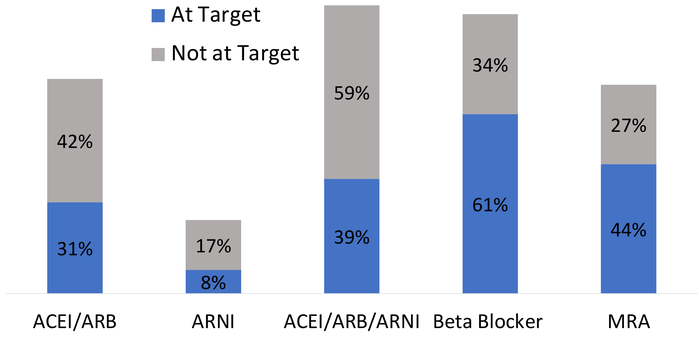
Baseline Characteristics (N=59)

Demographics	
Age – Years (mean ±SD)	73 ± 10
Male - no. (%)	39 (66.1)
Risk Factors	
BMI – Kg/m^2 (mean ±SD)	29 ± 6
Smoking history - no. (%)	20 (33.9)
Comorbidities	
Hypertension - no. (%)	42 (71.2)
Diabetes - no. (%)	16 (27.1)
Dyslipidemia - no. (%)	20 (33.9)
Stroke or TIA - no. (%)	10 (16.9)
CKD - no. (%)	27 (45.8)
Sleep apnea - no. (%)	9 (15.3)
Anemia - no. (%)	5 (8.5)
Prior MI - no. (%)	5 (8.5)
PCI - no. (%)	5 (8.5)

Table 1. Proportion of patients on GDMT at 1 year

	N (%)	Break Down N (%)	
Receiving GDMT	42 (71%)	ACEI/ARB + BB+ MRA	29 (49%)
		ARNI + BB + MRA	13 (22%)
No GDMT	17 (29%)	ACEI/ARB + BB	11 (19%)
		ACEI/ARB only	3 (5%)
		BB +ARNI	2 (3%)
		BB only	1 (2%)

Figure 1. Dosing of heart failure medications at 1 year



Results Continued

Figure 2. Proportion of patients received or planned to receive rhythm control at 1 year

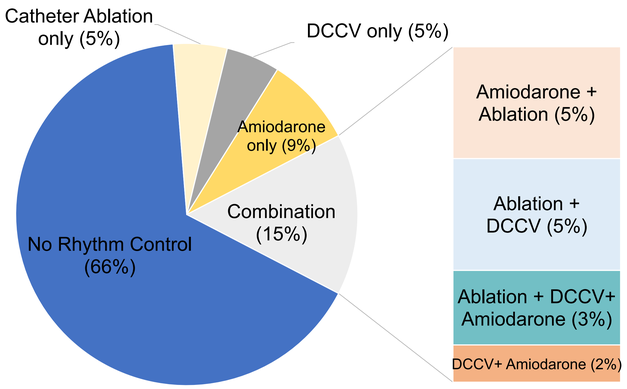
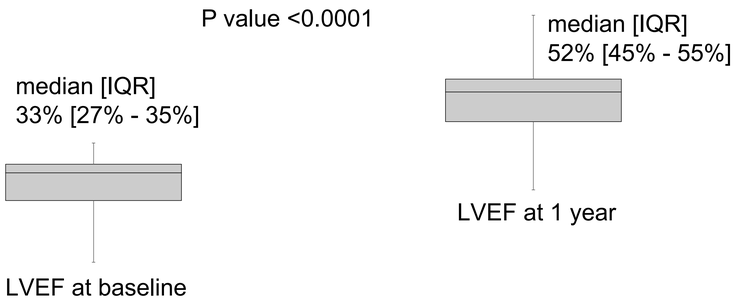


Figure 3. Change in left ventricular ejection fraction



Limitations

- Retrospective, single center, and small sample size.
- Did not capture why patients not on target doses were not unable to achieve target doses of heart failure medications.
- Details on rate vs rhythm control decision not obtained, and thus appropriateness of rhythm control can not be assessed.

Conclusions

- Most TMC patients were optimized on GDMT and one third received rhythm control at VGH cardiac function clinic.
- Mineralocorticoid receptor antagonist is the most common missing component of GDMT.
- Implementing strategies to improve MRA prescribing can further increase use of GDMT in the future.
- Further research is needed to establish optimal arrhythmia control strategies in TMC.