Impact of Pharmacist-Led Medication Titration in an Outpatient Heart Function Clinic

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Background

- In B.C. heart failure related hospitalization and mortality have reached an annual rate of 25.2% and 15.1%, respectively.[1,2]
- Landmark trials have shown that target doses of angiotensin-converting enzyme inhibitors (ACEIs), angiotensin receptor blockers (ARBs), beta-blockers (BBs) and mineralocorticoid antagonists (MRAs) reduce heart failure related morbidity and mortality. However, these evidence-based doses are infrequently achieved in clinical practice.
- Quantifying the proportion of patients that achieve target doses of heart failure medications in local outpatient clinics can help identify the clinical impact of sub-optimal medication regimens, as well as the barriers to up-titration to target doses.

Objectives

- **Primary:**
  - To determine the proportion of patients on target doses of heart failure medications (ACEIs/ARBs, BBs, MRAs) after 6 months of enrolment at the Heart Function Clinic in Jim Pattison Outpatient Care and Surgery Centre (JPOCSC).
- **Secondary:**
  - To determine the proportion of patients on ≥ 50% of target doses of heart failure medications after the 6 month intervention.
  - To compare hospitalization rates of patients not at target doses, at ≥ 50% of target doses and at target doses of heart failure medications after the 6 month intervention.
  - To understand the barriers to up-titration of heart failure medications to evidence-based target doses.

Methods

- **Design:** Retrospective chart review of patients enrolled at the Heart Function Clinic in JPOCSC between September 1, 2014 and August 31, 2016
- **Intervention:** Pharmacist-led titration over 6 months
- **Inclusion Criteria:** ≥ 18 years old, EF ≤ 40%, at least one in-person pharmacist appointment and attendance for a minimum of 6 months
- **Analysis:** McNemar's test and descriptive statistics

Results

Table 1. Baseline Population Characteristics (N=91)

Mean age ± SD (years)	67.4 ± 13.0
Male (%)	72.5
Mean weight ± SD (kg)	79.8 ± 21.0
Mean SBP ± SD (mmHg)	116.5 ± 16.6
Mean DBP ± SD (mmHg)	71.1 ± 9.0
Mean K^+ ± SD (mmol/L)	4.5 ± 0.5
Mean eGFR ± SD (mL/min)	64.3 ± 23.0
Mean EF ± SD (%)	28.2 ± 6.7
NYHA Class (%)	
I	28.6
II	42.9
III	14.3
Hypertension (%)	70.3
Atrial Fibrillation (%)	26.4
Coronary Artery Disease (%)	69.2
Diabetes (%)	50.5

Figure 1. Proportion of Patients At Target Doses.

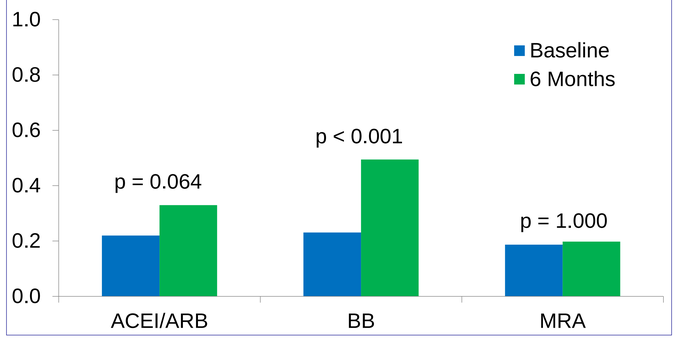


Figure 2. Proportion of Patients At ≥ 50% of Target Doses.

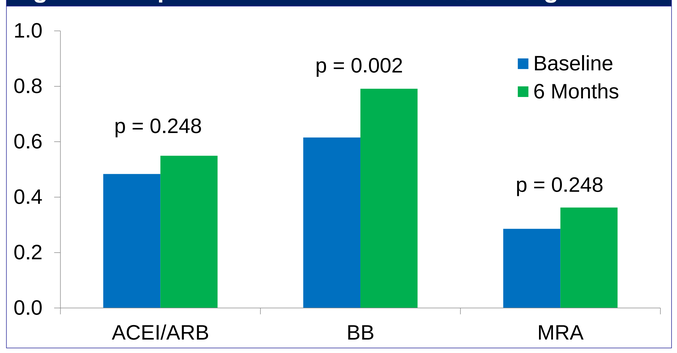
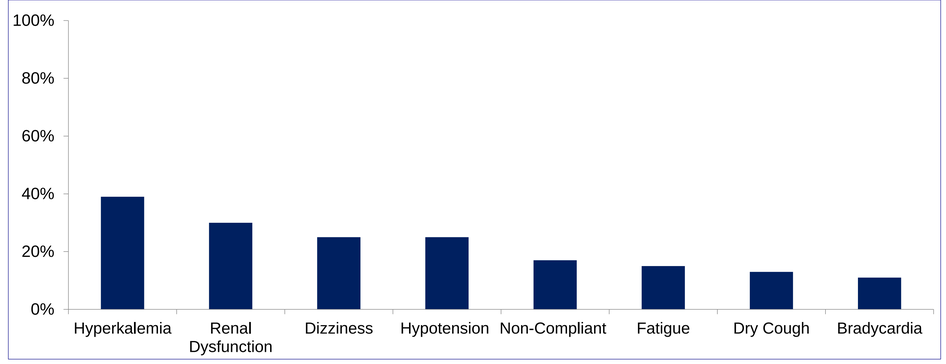


Table 2. Percentage of Patients With Heart Failure Related Hospitalizations.

	6 Months (n=91)			12 Months (n=78)		
	Not At Target	≥ 50% of Target	At Target	Not At Target	≥ 50% of Target	At Target
ACEI/ ARB	8.8	4.4	2.2	5.0	2.3	0
BB	5.5	12.1	5.5	4.7	2.5	0
MRA	11.0	1.1	1.1	3.8	2.3	1.1

Figure 3. Top 8 Barriers Impeding Up-Titration of Heart Failure Medications



Limitations

- Short duration
- Small sample size (underpowered)
- Potential underreporting of hospitalization rates as data was only obtained from Fraser Health sites
- Possible underreporting of barriers to up-titration as outcomes are based on chart notes written by pharmacist, nurse practitioner and/or cardiologist

Conclusions

- Outpatient pharmacist-led titration successfully increased the proportion of patients at target doses and ≥ 50% of target doses of heart failure medications over a 6 month period.
- A trend toward reduced hospitalization rates was seen in patients who were at target doses of heart failure medications. This trend was also seen for patients at ≥ 50% of target doses of ACEI/ARBs and MRAs.
- Hyperkalemia and renal dysfunction were found to be the most common barriers to up-titration of heart failure medications.

References

[1]Lee DS, Johansen H, Gong Y, Hall RE, Tu JV, Cox JL. Regional outcomes of heart failure in Canada. Can J Cardiol 2004;20(6):599-607.

[2]Statistics Canada. Table 1-11 deaths and mortality rate, by selected grouped causes, sex and geography - British Columbia [Internet]. 2009. [Cited 2016 Sep 10]. Available from: http://www.statcan.gc.ca/pub/84f0209x/2009000/t011-eng.pdf

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