An Assessment of Tolerability of Cardiac Medications in an Outpatient Heart Failure Clinic

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Background

- Heart failure (HF) is associated with poor prognosis, with a 5 yr age-adjusted mortality rate of 45%.
- ACE inhibitors (ACE-Is), angiotensin-receptor blockers (ARBs) and β-blockers (BBs) titrated to target doses can significantly reduce morbidity and mortality.
- Tolerability concerns impede titration to optimal doses and lead to their underuse, particularly in those ≥ 70 years.
- Literature suggests high BB tolerability in the elderly, but tolerated doses were well below doses achieved in landmark trials.
- Establishing local tolerability patterns and assessing impact of local HF clinics can aid in developing tools or strategies to improve tolerability in HF therapy.

Objectives

Primary Outcome: To compare proportion of HF patients at target doses of ACE-I/ARB and BB at baseline and 6 months follow-up of attendance at the Heart Function Clinic

Secondary Outcomes:

- To compare mean tolerated doses of ACE-I/ARBs and BB in population at baseline and 6 months
- To explore whether there are differences in achieving target dose based on age, sex, race, renal function, presence of COPD or asthma, spironolactone use and pharmacist involvement
- To describe adverse drug effects (ADRs) and limiting factors in population not at target dose at 6 months

Methods

Design: A retrospective chart review at Jim Pattison Outpatient Care and Surgery Centre (JPOCSC) Heart Function Clinic.

Population: HF patients with left ventricular systolic dysfunction identified through the clinic database and chart review.

Inclusion Criteria:

- ≥ 18 years old, systolic dysfunction defined as EF ≤ 40%
- Outpatients with a minimum of 6 months attendance at Heart Function Clinic between Dec 7th 2007 to June 7th 2012

Analyses:

- Primary outcomes: McNemar's test
- Secondary outcomes: T-test – mean % target doses, age, renal function, Pearson χ^2 test - sex, race, renal function, COPD or asthma, spironolactone, and pharmacist intervention
- Descriptive statistics - adverse drug reactions (ADRs)

Results

Table 1. Baseline Characteristics of Population (n=104)

Mean age ± SD (years)	70.7 ± 14.1
Male (%)	75.0
Mean weight ± SD (kg)	77.9 ± 20.7
Mean SBP ± SD (mmHg)	110 ± 17.8
Mean DBP ± SD (mmHg)	66 ± 10.0
Mean eGFR ± SD (mL/min)	60.0 ± 22.7
Atrial fibrillation (%)	43.3
Diabetes mellitus (%)	40.4
COPD or asthma (%)	27.9
Race (%)	
Caucasian	69.2
South East Asian	25.0
Other	5.8
NYHA Class (%)	
I	3.8
II	41.3
III	53.0
IV	1.9

Table 2. ACE-I or ARB mean and target doses achieved

	Baseline	6 months	p-value
Receiving ACE-I or ARB (%)	80.8	84.6	NS
Mean % of target dose ± SD	47.2 ± 37.6	48.7 ± 35.4	NS
Proportion with target dose achieved	0.28	0.25	NS

Table 3. β-blocker mean and target doses achieved

	Baseline	6 months	p-value
Receiving β-blocker (%)	81.7	83.7	NS
Mean % of target dose ± SD	45.4 ± 35.2	56.3 ± 36.5	0.001
Proportion with target dose achieved	0.23	0.36	0.004

Table 4. Effect of mean age on achieving target doses

Mean Age (years)	Baseline	p-value	6 months	p-value
At target for ACE-I/ARBs	68.2	NS	67.3	NS
Not at target for ACE-I/ARBS	71.7		71.9	
At target for BB	65.4	NS	64.3	<0.001
Not at target for BB	72.3		74.2	

- Sex, race, renal function, presence of COPD or asthma, spironolactone use and pharmacist involvement did not have an impact on the proportion of patients achieving target dose at baseline or 6 months.

Figure 1: Adverse Drug Reactions Reported in Population

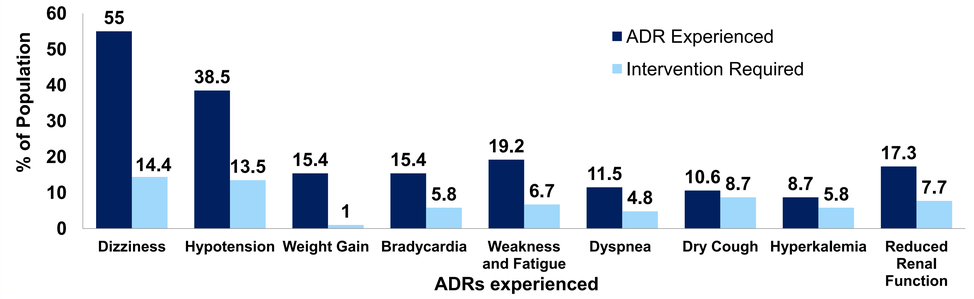
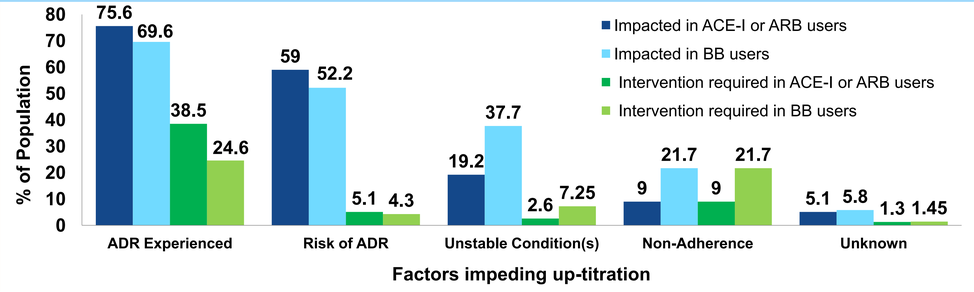


Figure 2: Factors impeding up-titration of medications in population not at target dose



Limitations

- Short study duration, only 6 months of clinic visits
- Potential underreporting of ADRs in notes written by physician vs. pharmacist
- Unable to capture some ADRs due to lack of routine vs. frequent monitoring
- Several confounders not captured (e.g. other medications, no. of clinic visits)

Conclusions

- JPOCSC Heart Function Clinic able to significantly increase proportion of patients receiving target dose of BB at 6 month follow-up
- Majority of patients remain on low doses of BB and ACE-I/ARB due to ADRs
- In most cases, dizziness and hypotension prevent up-titration of doses

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