Pharmacist Interventions to Reduce Polypharmacy and High Risk Medication Use Among Frail Elderly in Primary Care

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Canadian Frailty Network | Réseau canadien des soins aux personnes fragilisées

BACKGROUND

- Polypharmacy and certain high-risk medications are significant contributors to medication-related resource utilization among the community-dwelling elderly
- Frailty increases vulnerability such that the frail elderly are at an increased risk of medication-related adverse outcomes, emergency department utilization and hospitalization
- Several clinical trials have demonstrated the ability of pharmacist interventions to improve health outcomes among the geriatric population that include:[7-9]
  - Safety and patient adherence to pharmacotherapeutic treatments
  - Hospitalization
  - Therapeutic outcomes
- The Centre for Family Medicine Family Health Team initiated a new program called the "Case-Finding for Complex Chronic Conditions in seniors 75+ (C5-75)" in 2013 to:
  - Systematically screen for frailty amongst all persons aged 75 years older
  - Highlight and resolve medical conditions appropriately
  - Introduce a standardized medication review completed by a pharmacist to address medication related problems (MRPs)

PURPOSE

- To compare the mean number of medications and proportions of patients on high-risk medications and polypharmacy among frail elderly who underwent a pharmacist intervention to frail elderly who declined a pharmacist intervention at the Centre for Family Medicine Health Team

METHODS

Retrospective medical records review of:

1. Frail elderly patients seen by pharmacists in the C5-75 program from April 2013 to August 2015 (cases)
2. Matched cases in a 1:1 ratio to control population of frail elderly who were offered but declined a medication review with pharmacists

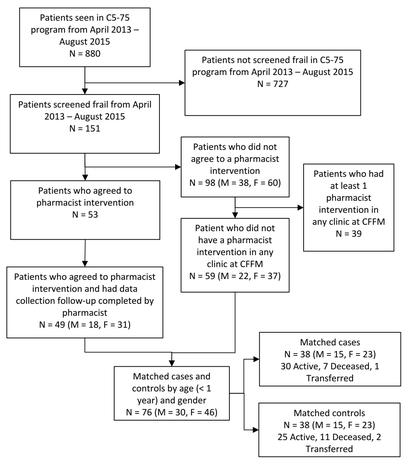
Inclusion Criteria

- Determined to be frail based on gait speed of > 6 seconds/4 meter walk test and/or CSHA CFS score of ≥4
- Age ≥ 75 years
- Male or female
- Taking at least one medication (prescription, over-the-counter, natural health products)

Data abstracted

- Demographics
- Medication history (prescription, over-the-counter, natural health products)
- Polypharmacy: use of ≥ 5 prescription medications
- High risk drugs: antiplatelets/anticoagulants, benzodiazepines & analogues; cardiovascular medications (digoxin, antihypertensive medications), insulin, nonsteroidal antiinflammatory drugs, and opioids/narcotics
- Recommendations documented and suggested by pharmacists

Figure 1: *Selection process methodology of cases and controls*



Analysis of data

1. Descriptive statistics (means, medians, standard deviations, and frequencies) were generated to describe study population and compare the two groups at 3 time points (date of frailty, date of initial medication review, date of last medical note/date of death)
2. Chi-square (or Fischer's exact) was used to analyze discrete variables
3. Continuous variables were analyzed for significance through student's t-test and ANOVA
4. Odds ratio for polypharmacy, high-risk medication use and use of appropriate gastrointestinal protection was calculated between two groups

Polypharmacy: Use of 5 or more prescription medications

RESULTS

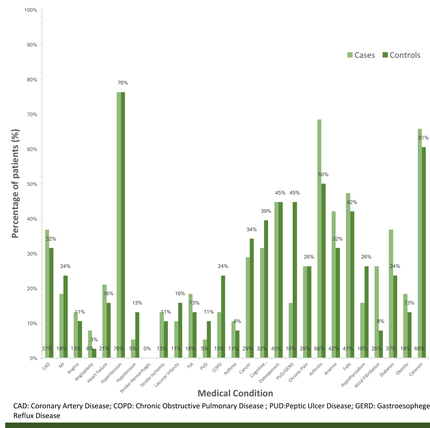
Demographics

Table 1: *Demographics of cases and controls (n = 76)*

		Cases (n = 38)			Controls (n = 38)		
		Male	Female	Overall	Male	Female	Overall
Age	Mean			85			85
	Range			75-98			76-94
Diagnosed medical conditions per patient	Mean	5.07	5.14	5.18	5.00	5.77	5.37
	Range	1-11	2.9	1-11	3-9	2-9	2-9

Medical Conditions

Figure 2: *Diagnosed medical conditions identified in cases and controls (n = 76)*



CAD: Coronary Artery Disease; COPD: Chronic Obstructive Pulmonary Disease ; PUD:Peptic Ulcer Disease; GERD: Gastroesophegeal Reflux Disease

Medications

Table 2: *Summary of medication history for cases and controls at date of frailty, initial medication review and date of last medical note (n = 76)*

		Cases (n = 38)	Controls (n = 38)	Statistical Procedure
				Paired samples test (2- tailed)
# of medications per patient	DOF	9.11 ± 3.65	9.05 ± 5.47	0.954
	IMR	10.47± 3.75	8.76 ± 5.65	0.122
	DOLM/DOD	9.55± 3.73	8.58 ± 5.07	0.363
# high risk drugs per patient	DOF	3.29 ± 1.97	3.03 ± 2.21	0.593
	IMR	3.11 ± 1.87	2.89 ± 2.23	0.667
	DOLM/DOD	2.89 ± 1.84	2.53 ± 2.08	0.398
				Fisher's Exact Test (2-sided)
% of patients on ≥ 1 high risk drug	DOF	89%	84%	0.736
	IMR	89%	84%	0.736
	DOLM/DOD	84%	84%	1.000
% of patients on ≥ 5 Rx (polypharmacy)	DOF	92%	79%	0.191
	IMR	82%	74%	0.583
	DOLM/DOD	89%	71%	0.082
% of patients on antithrombotic therapy	DOF	47%	47%	1.000
	IMR	61%	47%	0.357
	DOLM/DOD	55%	50%	0.819
				Pearson Chi-Square (2-sided)
% of appropriate use of GI protection	DOF	No GI protection required	63%	63%	1.000
		Yes	3%	3%	
		No	34%	34%	
	IMR	No GI protection required	68%	63%	0.669
		Yes	5%	3%	
		No	26%	34%	
	DOLM /DOD	No GI protection required	66%	63%	0.969
		Yes	5%	5%	
		No	29%	32%	

DOF: Date of Frailty; IMR: Date of Initial Visit with Pharmacist; DOLM/DOD: Date of Last Medical Note/Date of Death

Pharmacist Interventions

Figure 3: *Types of medication related problems identified by pharmacists at initial medication review (n = 41)*

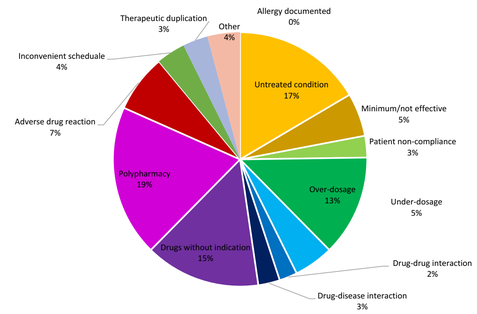


Figure 4: *Recommendations documented and suggested by pharmacists at initial medication review (n=41)*

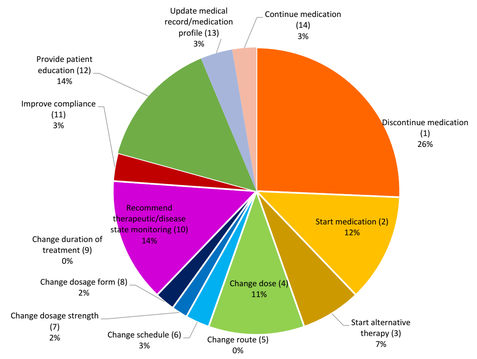
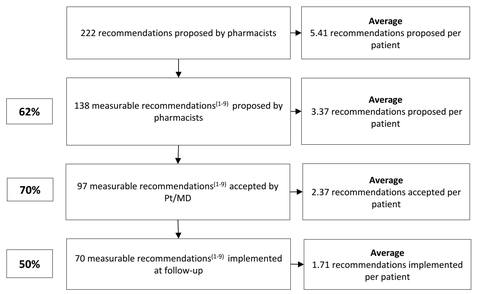


Figure 5: *Acceptance and implementation of recommendations proposed by pharmacists (n = 41)*



Measurable recommendations: [1]Discontinue medication; [2]Start medication; [3]Start alternative therapy; [4]Change dose; [5]Change route; [6]Change Schedule; [7]Change dosage strength; [8]Change dosage form; [9]Change duration of treatment

Table 3: *Medication related problems identified and recommendations documented and suggested by pharmacist at initial medication review (n = 41)*

Medication Related Problems		Recommendations Documented and Suggested	
# of patients with ≥ 1 MRP identified	41/41	# of patients with ≥ 1 recommendation documented and suggested by pharmacist	40/41
Total # of MRPs identified	218	Total # of recommendations made	222
Average # of MRPs identified per patient	5.32	Average # of recommendations made per patient	5.41
Minimum # of MRPs identified per patient	2	Minimum # of recommendations made per patient	0
Maximum # of MRPs identified per patient	10	Maximum # of recommendations made per patient	13

DISCUSSION/ CONCLUSIONS

- The mean total number of medications was not significantly different between cases and controls at initial visit (10.5 vs. 8.8, p = 0.122) or at the end of the study period (9.6 vs. 8.6, p = 0.363)
- High risk medications was highly prevalent amongst both populations (cases: 89%, controls 84%) at baseline and at the end of the study period (84% in both populations)
- Cardiovascular medications were seen to be the most frequently used high risk medication between both groups
- Discontinuing medication was the top recommendation made by pharmacists (26% of all recommendations made)
- Of the 138 measurable recommendations, 70% were accepted by physicians however only 50% were implemented at the most recent follow-up
- Polypharmacy, high-risk medication use and medication related problems are readily identifiable in the frail community-dwelling elderly in primary care
- Additional research is warranted to investigate the optimization and communication between health care practitioners to increase implementation of recommendations provided by pharmacists as well as strategies for successful de-prescribing of medications

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CONTACT INFORMATION

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