Project Title

Feasibility & Efficacy of Deprescribing rounds in a Singapore rehabilitative hospital- a randomised controlled trial

Project Lead and Members

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Organisation(s) Involved

Bright Vision Hospital (SingHealth Community Hospitals); Agency of Integrated Care

Healthcare Family Group(s) Involved in this Project

Medical; Pharmacy; Nursing

Applicable Specialty or Discipline

Geriatric Medicine, Health Education

Project Period

Start date: November 2018

Completed date: August 2019

Aims

To determine the efficacy, safety and feasibility of weekly patient-centric multidisciplinary team-led deprescribing rounds in a Singapore rehabilitation hospital.

Project Attachment

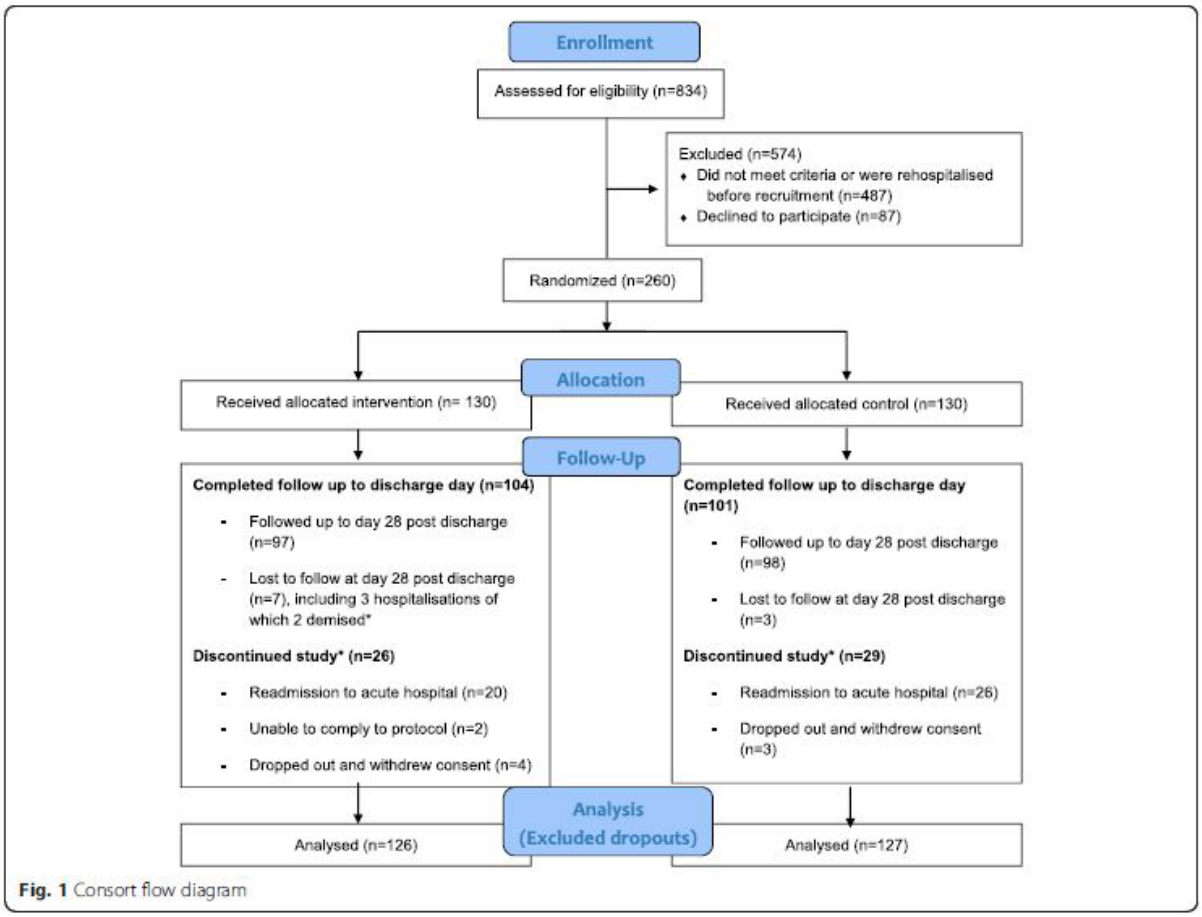

Fig. 1 Consort flow diagram

Table 1 Baseline Characteristics

	Intervention (*N* = 126)	Control (*N* = 127)
Demographics		
Age, Median (IQR)	76 (70, 81)	75 (70, 80)
Female, N (%)	73 (58.7)	76 (59.8)
Ethnicity		
Chinese, N (%)	109 (86.5)	112 (88.2)
Malay, N (%)	8 (6.4)	7 (5.5)
Indian, N (%)	8 (6.4)	8 (6.3)
Eurasian, N (%)	1 (0.8)	0 (0.0)
Discipline		
Rehabilitation, N (%)	102 (81.0)	100 (78.7)
Subacute, N (%)	24 (19.1)	27 (21.3)
Other parameters		
AMT Score, Median (IQR)	10.0 (9, 10)	10.0 (9, 10)
Length of Stay in days, Median (IQR)[c]	27 (17.5, 38)[a]	22 (13, 32)[b]
Baseline medicine parameters		
Total Daily Dose (TDD), Median (IQR)	23 (18, 28)	23 (18, 29)
Total Number of Medicine (TNM), Median (IQR)	13 (11, 16)	13 (10, 17)
Total Daily Cost (TDC) in S$, Median (IQR)	5.94 (4.32, 9.08)	6.18 (3.98, 9.74)

[a]n = 124; [b]n = 127; [c]p = 0.040
Note: p is ≥0.05 for all characteristics except for length for stay
IQR: Interquartile range

Table 2 Efficacy Outcomes

A. Percentage change from baseline for medicine parameters expressed in median (interquartile range)

Outcome	Phases	Intervention (N = 126)	Control (N = 127)	*p* value
Total Daily Dose (TDD)	Inpatient phase, day 14 postrecruitment	−-12.50 (−27.27, 0.00)	0.00 (−11.43, 6.67)	< 0.001
	Inpatient phase, day 28 postrecruitment	−14.91 (−32.00, 0.00)	0.00 (− 11.76, 7.14)	< 0.001
	Discharge day **(Primary Outcome)**	− 19.62 (− 34.38, 0.00)	0.00 (− 12.00, 6.82)	< 0.001
	Outpatient phase, day 28 postdischarge	− 22.54 (− 41.18, 0.00)	-7.69 (− 28.57, 0.00)	0.001
Total Number of Medicine (TNM)	Inpatient phase, day 14 postrecruitment	−5.26 (− 16.67, 0.00)	0.00 (−9.09, 5.88)	0.008
	Inpatient phase, day 28 postrecruitment	0.00 (− 18.18, 5.56)	0.00 (−10.00, 5.88)	0.035
	Discharge day	−5.56 (−20.00, 0.00)	0.00 (−11.76, 5.88)	0.035
	Outpatient phase, day 28 postdischarge	−7.14 (−23.08, 0.00)	0.00(−16.67, 5.56)	0.203
Total Daily Cost (TDC)	Inpatient phase, day 14 postrecruitment	−8.91 (−27.55, 0.00)	0.00 (−14.99, 3.57)	0.004
	Inpatient phase, day 28 postrecruitment	−10.66 (−35.86, 0.00)	0.00 (−15.83, 5.63)	0.002
	Discharge day	−14.74 (−38.22, 0.00)	0.00 (−23.90, 7.60)	0.001
	Outpatient phase, day 28 postdischarge	−17.31 (−47.07, 0.00)	−7.61 (−37.63, 1.80)	0.116

B: Analysis of the change of TDC/TNM/TDC across time using GLMM

		Regression Coefficient (95% CI)	p value
TDD	Unadjusted group effects	−2.836 (−4.888, −0.785)	0.007
	Adjusted* group effects	−3.113 (−5.153, −1.072)	0.003
TNM	Unadjusted group effects	−0.830 (−1.875, 0.216)	0.120
	Adjusted group effects	−0.994 (−2.046, 0.0587)	0.064
TDC	Unadjusted group effects	−3.564 (−10.882, 3.754)	0.340
	Adjusted group effects	−3.585 (−10.830, 3.661)	0.332

Note: Percentage change from baseline is calculated for every individual participant before their collective median (IQR) is computed
*Adjusted for repeated measurements throughout the study

Table 3 Safety Outcomes

A. Medicine associated with symptom recurrence after deprescribing

	Intervention Group		Control Group		Odds Ratio (95% CI)	p value
	Number of patients with target medicine initially deprescribed N	Number of patients with symptom recurrence n (%)	Number of patients with target medicine initially deprescribed N	Number of patients with symptom recurrence n (%)		
Painkillers	102	24 (23.5)	76	11 (14.5)	1.80 (0.83, 3.99)	0.140
Laxatives	80	51 (63.8)	47	15 (31.9)	3.75 (1.75, 8.06)	< 0.001
Antiemetics	37	5 (13.5)	31	3 (9.7)	1.46 (0.32, 6.66)	0.630
Gastroprotectives	40	8 (20.0)	32	7 (21.9)	0.89 (0.29, 2.80)	0.850
Steroid Creams	10	4 (40.0)	13	4 (30.8)	1.50 (0.27, 8.45)	0.650
Vitamin B based supplements	19	2 (10.5)	4	1 (25.0)	0.35 (0.02, 5.23)	0.450
Glucosamine	6	0 (0.0)	0	0 (0.0)	N.A.	N.A.
Multivitamins	1	0 (0.0)	0	0 (0.0)	N.A.	N.A.
Diuretics	4	0 (0.0)	4	2 (50.0)	N.A.	N.A.
Benzodiazepines	4	2 (50.0)	2	1 (50.0)	1.00 (0.03, 29.81)	1.000
Antihistamines (for insomnia)	3	0 (0.0)	3	1 (33.3)	N.A.	N.A.
Antihistamines (for itch)	5	2 (40.0)	4	1 (25.0)	2.00 (0.11, 35.81)	0.640
Opioids (for Cough)	18	2 (11.1)	21	3 (14.3)	0.75 (0.11, 5.07)	0.770
Opioids (for diarrhoea)	1	1 (100.0)	3	2 (66.7)	N.A.	N.A.

B. Medicine which are restarted or substituted after deprescribing

	Intervention		Control		Odds Ratio (95% CI)	p value
	Number of patients with target medicine initially deprescribed n	Number of patients with medication restarted/ substituted n (%)	Number of patients with target medicine initially deprescribed n	Number of patients with medication restarted/ substituted n (%)		
Painkillers	102	67 (65.7)	77	46 (59.7)	1.29 (0.70, 2.38)	0.410
Laxatives	84	39 (46.4)	51	12 (23.5)	2.82 (1.30, 6.12)	0.009
Antiemetics	37	5 (13.5)	31	6 (19.4)	0.65 (0.18, 2.38)	0.520
Gastroprotectives	44	7 (15.9)	34	9 (26.5)	0.53 (0.17, 1.60)	0.260
Steroid Creams	10	3 (30.0)	13	6 (46.2)	0.50 (0.09, 2.84)	0.430
Vitamin B based supplements	18	3 (16.7)	4	0 (0.0)	N.A.	N.A.
Glucosamine	7	2 (28.6)	0	0 (0.0)	N.A.	N.A.
Multivitamins	1	0 (0.0)	0	0 (0.0)	N.A.	N.A.
Diuretics	5	0 (0.0)	5	1 (20.0)	N.A.	N.A.

Table 3 Safety Outcomes *(Continued)*

A. Medicine associated with symptom recurrence after deprescribing						
Benzodiazepines	5	1 (20.0)	2	0 (0.0)	N.A.	N.A.
Antihistamines (for insomnia)	4	2 (50.0)	3	2 (66.7)	0.50 (0.02, 11.09)	0.660
Antihistamines (for itch)	6	2 (33.3)	5	0 (0.0)	N.A.	N.A.
Opioids (for cough)	19	3 (15.8)	23	7 (30.4)	0.43 (0.09, 1.96)	0.270
Opioids (for diarrhoea)	2	1 (50.0)	3	2 (66.7)	0.50 (0.01, 19.56)	0.710
C: Hospitalisation and deaths						
	Intervention (N = 126)	**Control (N = 127)**	**Odds Ratio (95% CI)**	**p value**		
Hospitalisations, n (%)	23 (18.3)	26 (20.4)	0.87 (0.46, 1.62)	0.655		
Deaths, n (%)	2 (1.6)	0 (0)	N.A.	0.247		

Table 4 Reasons for hospitalisations, deaths and dropouts

	Intervention	Control
Hospitalisations	***N* = 23** Elective cholangiopancreatogram (n = 1) Fluid overload with pneumonia (*n* = 1) Pleural effusion (*n* = 1) Sepsis (*n* = 5) Haemoptysis for workup (*n* = 1) Worsening neuropathy (*n* = 1) Suspected stroke (*n* = 1) Rectal bleeding for workup (n = 1) Suspected fracture (n = 1) Suspected septic arthritis (n = 2) Suspected myocardial infarction (n = 1) Worsening wound infection (n = 1) Altered mental state for workup (n = 1) Worsening gangrene (n = 1) Suspected deep vein thrombosis (n = 1) Fluid overload (n = 1) Pneumonia (n = 1) * Lung Cancer (n = 1) *	***N* = 26** Elective knee replacement (n = 1) Elective nephrectomy (n = 1) Fast atrial fibrillation (n = 1) Suspected deep vein thrombosis (n = 1) Worsening renal impairment (n = 1) Removal of central venous catheter (n = 1) Worsening anaemia (n = 3) Sepsis (n = 2) Fluid overload (n = 1) Suspected implant infection (n = 1) Suspected myocardial (*n* = 3) Worsening numbness (n = 1) Pneumonia with seizures (n = 1) Severe hyponatremia (n = 1) Fluid overload, pneumonia & fast AF (n = 1) Worsening ascites(n = 1) Incarcerated hernia (n = 1) Worsening fracture (n = 1) Hematemesis (n = 1) Finger abscess (n = 1) Intestinal obstruction (n = 1)
Deaths	**N = 2** Pneumonia (n = 1) Lung Cancer (n = 1)	
Dropouts	***N* = 4** Patient felt study was not helpful to him (n = 1) Patient prefers to continue current medicine (n = 3)	**N = 3** Patients felt study was not helpful to them (n = 2) Patient prefers to continue usual medicine (n = 1)

*demised

Background

Deprescribing is effective and safe in reducing polypharmacy among the elderly. However, the impact of deprescribing rounds remain unclear in Asian settings. Thus, the study team wanted to study the efficacy, safety and feasibility of such rounds

Methods

An open label randomised controlled trial was conducted on patients of 65 years and above, under rehabilitation or subacute care and with prespecified medications from Bright Vision Community Hospital. They were randomised using a computer generated sequence. The intervention consisted of weekly multidisciplinary team-led deprescribing rounds (using five steps of deprescribing) and usual care. The control

had only usual care. The primary outcome is the percentage change in total daily dose (TDD) from baseline upon discharge, while the secondary outcomes are the total number of medicine, total daily cost and TDD up to day 28 postdischarge, overall side-effect rates, rounding time and the challenges. Efficacy outcomes were analysed using intention-to-treat while other outcomes were analyzed as per protocol.

Results

260 patients were randomised and 253 were analysed after excluding dropouts (female: 57.3%; medianage: 76 years). Baseline characteristics were largely similar in both groups. The intervention arm (n = 126) experienced a greater reduction of TDD on discharge [Median (IQR): − 19.62% (− 34.38, 0.00%) versus 0.00% (−12.00, 6.82%); $p < 0.001$], more constipation (OR: 3.75, 95% CI:1.75–8.06, $p < 0.001$) and laxative re-prescriptions (OR:2.82, 95% CI:1.30–6.12, $p = 0.009$) though death and hospitalisation rates were similar. The median rounding time was 7.09 min per patient and challenges include the inconvenience in assembling the multidisciplinary team. This showed that deprescribing rounds can safely reduce TDD of medicine upon discharge compared to usual care in a Singaporean rehabilitation hospital.

Lessons Learnt

Subject Matter

- The study team has learnt that deprescribing rounds have led to an improvement in the total daily doses of medicine up to 1 month post inpatient discharge and this is shown to be safe.

Processes

- A systematic, evidence-based and patient centred approach should be implemented in every de-prescribing attempt for the sustainability in reducing polypharmacy.
- De-prescribing rounds could be performed in a relatively short duration time (average 7 minutes per person), although it may be inconvenient to assemble a team at every attempt.

Conclusion

See poster appended.

Additional Information

Accolades: Most of the patients involved in the study were happy to consider de-prescribing upon recruitment and to be involved in the decision making process. Care providers (e.g ward team) were happy to have an additional service to assist in deprescribing.

Challenges: It may be inconvenient to assemble a team for deprescribing rounds and at times the same members may not be present. There is insufficient resources to study the long term effects of such rounds beyond 1 month post inpatient discharge

Project Category

Applied/ Translational Research

Qualitative Research

Care & Process Redesign

Quality Improvement, Clinical Practice Improvement, Value Based Care, Safe Care

Keywords

Deprescribing, Rounds, Multidisciplinary Team, Open Label, Randomised Controlled Trial

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