

GERIATRIC DAY HOSPITAL: AN OUTCOME STUDY

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Summary

In a retrospective and prospective study of 668 patients discharged from two geriatric day hospitals in Hong Kong over a one-and-half year period, we have found statistically significant improvement in the self-care ability and mobility of the discharged patients. The improvements also reached statistical significance for the three major diagnostic groups: stroke, parkinsonism and hip fractures.

Introduction

The first Geriatric Day Hospital (GDH) was opened in 1958 in the United Kingdom. In Hong Kong, the first GDH started to operate in Princess Margaret Hospital in 1975. Although GDH has been regarded as an indispensable part of geriatric service¹, various authors have emphasized the need for evaluation^{2,3,4}. The importance of evaluation of GDH has also been recognized locally and a working group was formed in September 1992 to address this issue⁵. Evaluation of GDH can be approached by either assessing its efficiency using some "activity indicator", or alternatively assessing its effectiveness by using an instrument to measure the change in physical and mental functioning of the treated patients⁶. There have been some studies on the activities of GDH abroad^{3,7,8,9} and locally^{6,10,11,12}. However, there have been few controlled studies on the effectiveness of GDH by quantifying the final outcome of the patients treated^{13,14,15}. Both Woodford-Williams¹³ and Tucker¹⁴ found a sustained improvement in mood and morale in the GDH group, while Eagle¹⁵ found a significant difference in favour of the control group in the effect of treatment on emotions. As for physical functioning, both Woodford-Williams¹³ and Eagle¹⁵ found no significant difference between the GDH and control groups, while Tucker¹⁴ showed that day hospital patients had a significant improvement in performance of activities of daily living at six weeks but not at five months.

We performed a retrospective and prospective uncontrolled study to assess the effectiveness of rehabilitation of physically disabled patients in two of the Geriatric Day Hospitals in Hong Kong.

Methods

We started the study in October 1992. All new patients admitted into Ngau Tau Kok and Yung Fung Shue Geriatric Day Hospitals after 1.1.1991 and discharged within the period of 1.1.1992 - 30.6.1993 were recruited into the study. The reason for inclusion of patients within the specified admission period was that we started to adopt a standardized assessment instrument for the two GDHs since September 1990. We allowed a grace period of four months for the staff to get used to the new instrument before recruitment. We used modified forms of Rivermead Activities of Daily Living (ADL) scale¹⁶ and Abbreviated Mental Test¹⁷ (AMT) to assess the physical and mental functioning of GDH patients (Appendix). Modifications were made to adjust for the socio-cultural differences of Hong Kong Chinese.

The two GDHs were under the same administration. The physiotherapists, occupational therapists and medical officers were all trained in the assessment, and there were specific instructions for the assessment. Each patient was reassessed by the same staff as far as possible. These measures helped to minimize any inter- and intra-rater variability.

All new patients admitted within the quoted period were first scored in terms of their baseline self-care ability (maximum score 39) by occupational therapists, mobility (maximum score 24) by physiotherapists, and cognitive function (maximum score 10) by medical officers. The household ability was assessed by occupational therapists for selected patients not living in institutions. Since the household ability was not routinely assessed, this aspect of physical function was not included in the present analysis. The progress of patients was reviewed in multi-disciplinary conferences after a course of about twelve treatment sessions, when it was decided whether a patient could be discharged or further treatment was required. The final score of the physical functioning at discharge was recorded. Patient characteristics in terms of age, sex, diagnosis, and initial placement were also recorded. These data were entered into a database program.

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Statistical analysis was performed using the SPSS/PC¹⁸ statistical package. For descriptive data, mean, range and standard deviation (SD) were analyzed. For comparative data, paired T-test with mean, standard error of the mean (SEM), and p-value were analyzed. Pearson correlation coefficient was used to assess the relations between variables.

Results

Data on 668 patients were obtained. However, data were missing for several variables, in particular initial AMT

score (110 missing), self-care score (25 missing), and mobility score (33 missing). Patient characteristics were shown in Table 1. The initial and final self-care scores, as well as the initial and final mobility scores were shown in Table 2. We found that there was overall statistically significant improvement in the self-care ability and mobility for patients discharged from GDH (Table 3). The improvement was also seen when the three major diagnostic groups (stroke, parkinsonism, hip fractures) were analyzed separately (Table 3).

Attempts were also made to identify the possible

Table 1. Characteristics of patients on admission into GDH (n=668)

Male : Female	255 : 413
Mean age in years (range, SD)	75.2 (53-99, 8.58)
Mean duration of stay in days (range, SD)	157 (3-789, 130)
Mean number of GDH visits (range, SD)	30.4 (2-119, 18.9)
Placement on admission:	
Home - alone	32 (5%)
Home - with carer	419 (63%)
Institution	215 (32%)
Unknown	2
Principal diagnosis:	
Stroke	438 (66%)
Hip fractures	98 (15%)
Parkinsonism	54 (8%)
Arthritis	22 (3%)
Acute illness	9 (1%)
Amputee	5 (1%)
Social Problems	0 (0%)
Others	42 (6%)
Initial mean AMT score (range, SD) (n=558)*	7.38 (0-10, 2.56)

* 110 patients were excluded from analysis of AMT score because of incomplete data

Table 2. Self-care and mobility scores, before and after treatment

Physical function	Mean score (range, SD)
Self-care ability:	n=643*
Initial	29.3 (0-39, 7.9)
Final	31.5 (0-39, 7.9)
Change	2.15 (-12 to +19, 4.1)
Mobility:	n=635#
Initial	12.9 (0-24, 6.15)
Final	15.9 (0-24, 6.4)
Change	2.86 (-19 to +18, 4.26)

* 25 patients excluded from analysis of ADL score because of incomplete data

33 patients excluded from analysis of mobility score because of incomplete data

Table 3. Change in self-care and mobility scores with treatment

Physical function of diagnostic groups	Mean difference	SEM	p value
Self-care ability			
Overall (n=643)	+2.15	0.16	< 0.0005
Stroke (n=425)	+2.49	0.20	< 0.0005
Parkinsonism(n=52)	+2.36	0.61	< 0.0005
Hip fractures (n=96)	+1.21	0.33	< 0.0005
Mobility			
Overall (n=635)	+2.86	0.17	< 0.0005
Stroke (n=428)	+3.10	0.20	< 0.0005
Parkinsonism(n=51)	+3.67	0.63	< 0.0005
Hip fractures (n=95)	+1.69	0.38	< 0.0005

variables that may affect the outcome of rehabilitation. In particular, we looked at whether age and initial AMT score would affect the increment of the self-care ability and mobility score. All the calculated absolute *r* values were less than 0.28, suggesting that there was no significant correlation.

Discussion

The functions of a GDH have been stated in Brocklehurst's review² as rehabilitation, maintenance, assessment, medical and nursing care, and social care. Of these five functions, rehabilitation has been ranked by geriatricians as the most important². The rehabilitative input in a GDH helps patients to recover from the disabling diseases associated with old age, in particular strokes, parkinsonism, hip fractures and arthritis, which constitute the major diagnostic groups in our two GDHs (Table 1). Since rehabilitation is a finite and dynamic process anticipating functional recovery or improvement, assessment of its effectiveness depends on some measurement of physical function before and after treatment. The adoption of a standardised assessment instrument in two GDHs facilitated the present study on the effectiveness of GDHs in the rehabilitation of the physically disabled elderly patients.

Over the one-and-half year study period, 688 patients were discharged from the two GDHs. Our results showed that, at discharge, there was an increment of 2.15 in the self-care score and an increment of 2.86 in the mobility score (Table 2). The improvements were statistically significant ($p < 0.0005$). The improvement in mobility was greater than that of self-care. This might be attributed to the higher initial self-care score (29.3/39, within the upper 25 percentile range) as compared with the initial mobility score (12.9/24, just above the 50% percentile) so that ceiling effect might have occurred. Assessment of the household ability would probably overcome this ceiling effect, but such assessment had not been routinely practised in the two GDHs.

Improvements were also present in the three main categories of patients referred to the GDHs (Table 3). The improvements in self-care and mobility were more marked in patients with stroke and parkinsonism and less so in patients with hip fractures. However, the Rivermead ADL scale was initially designed for stroke and neurological patients¹⁹ and it is questionable whether the scale could be applied to patients with hip fractures.

Of the 13 patients aged below 65, all were rehabilitated for stroke. Traditionally, GDHs have adopted an age-related approach, taking in patients aged 65 or over. However, a need-related approach²⁰ may be more rational: geriatricians taking those patients whose medical and social problems indicate that they would benefit from the holistic team approach available in GDH. This is particularly applicable to strokes of whatever age. We also

examined whether age or the mental score (AMT) would affect the outcome of rehabilitation. However, no statistical correlation could be detected. Two factors might explain why we could not demonstrate any negative correlation between poor cognition and rehabilitation. Firstly, there is a high proportion of missing data (110 out of 668) for the AMT score, and it could be that most of these belong to the cognitively impaired group. Secondly, there may be selective referrals of patients with good mental state to GDH, as evidenced by the high mean AMT score of 7.38.

Being an uncontrolled study, it has its limitations. Firstly, we cannot tell how much of the functional improvement was due to the day hospital treatment and how much was due to the natural recovery of the disease. Elucidation of this would require a 'no treatment' control arm and would have ethical implications. Secondly, we are unable to show that the functional improvement was due to some specific element of the day hospital and could not have been achieved by alternative forms of care. Donaldson²¹ has critically reviewed the subject of GDH evaluation and has proposed a set of rigorous criteria for the evaluation of day hospital care which would involve the use of randomised controlled clinical trial, with specification of alternatives, measurement of effectiveness, and the measurement of costs. However, this is most difficult in Hong Kong. Previous studies^{14,15} have chosen the alternative of in-patient treatment and out-patient follow-up supplemented by community services or domiciliary physiotherapy as the control group, but such alternative resources are not readily available in Hong Kong and there is no domiciliary physiotherapy service locally.

Although our study is partially retrospective, incomplete data was minimal and this was compensated by the large sample size. Recall bias may be a problem in a retrospective study, but this is not a case here. All the parameters used were routinely practised in the GDHs, and patients were assessed within the first week of admission to GDH or at subsequent review conference. Another limitation of the present study is that only discharged patients were included in the analysis. However, the proportion of patients maintained indefinitely in the two GDHs were small.

Conclusion

We have shown that patients improve in physical functioning after rehabilitation in geriatric day hospitals. However, several questions still need to be answered. Is GDH treatment more effective than conventional treatment? Which component(s) of therapy in GDH is essential for its success? Is GDH worth of the money? Is there other more cost-effective alternative? Further studies on GDH will be required to answer these questions.

Appendix

GERIATRIC DAY HOSPITAL PHYSICAL & MENTAL FUNCTIONAL ASSESSMENT

Name: Sex/Age: OPD No.:
 Date of adm.: Home: alone/ carers/ institution
 Diagnosis: (onset date:)

ACTIVITY	ABILITY				AIDS / TOTAL	SCORE
	D	A	S	I		
A. Self-care	0	1	2	3		
1 Combing/shaving
2 Drinking
3 Eating
4 Washing face
5 Oral cleaning
6 Undressing Upper
7 Dressing Upper
8 Undressing Lower
9 Dressing Lower
10 Toileting
11 Bathing: wash
12 Bathing: dry
13 Preparing water
B. Household	0	1	2	3		
1 Washing smalls
2 Light cleaning
3 Hang out washing
4 Preparing meal
5 Shopping
6 Heavy cleaning
C. Mobility	0	1	2	3		
1 Sit to stand
2 Stand to sit
3 Bed to chair
4 Indoor (5m)
5 Up stair (8st)
6 Down stair (")
7 Outdoor (50m)
8 Public transp.
D. Mental status	0	1				
1 Age (± 5yr.)	.	.				
2 Birthday (d,m)	.	.				
3 Time (a,p,n)	.	.				
4 Year (± 1yr.)	.	.				
5 Place name	.	.		1		
6 Recog. 2 persons	.	.				
7 Leader name	.	.		2		
8 Mid-autumn festival	.	.				
9 Count 20-1 back	.	.		3		
10 Recall address	.	.				
42 Shanghai St.	.	.				

Profiles
 dotted black
 black line
 red line
 blue line

Dates
 premorbid
 / /
 / /
 / /

Dependent
 patient can't participate;
 ≥ 2 assist.
 Assistance
 one manual assist.
 Supervision
 verbal prompting
 Independent
 ± aids

GERIATRIC DAY HOSPITAL PHYSICAL & MENTAL ASSESSMENT: INSTRUCTIONS

A. Self-care

1. Combing hair (female)/ shaving (male, electric shaver): to complete with presentable appearance.
2. Drinking: to pour luke-warm water from 1/2 filled thermoflask (0.8L with handle) to plastic cup (3/4 full) and drink without spilling.
3. Eating: to pick food from bowl with spoon, chopsticks or fork, put to mouth and swallow without messing table/clothes.
4. Washing face: to manage water tap, wring towel without dripping & wash face at basin.
5. Oral cleaning: to manage tap, unscrew and squeeze toothpaste on brush & brush teeth/rinse mouth & clean dentures thoroughly.
6. Undressing upper garment: to unbutton front line and take off garment.
7. Dressing upper garment: to put on garment & button up front line correctly.
8. Undressing lower garment: to take off shoes and lower garment with elastic waistband.
9. Dressing lower garment: to put on lower garment and shoes.
10. Toileting: to transfer to and from toilet seat (washroom/commode), manage pants, cleaning and transfer.
11. Bathing- wash: showing movements to wash all over body in sitting position.
12. Bathing- dry: to dry all over body in sitting position.
13. Preparing water: to prepare hot water for bathing safely.

B. Household

1. Washing: handwash smalls at sink.
2. Light cleaning: to clean and tidy surfaces of height knee level to shoulder level.
3. Hang out washing: on rail indoors, away from sink, no pegs.
4. Preparing meal: to wash and cut up food, season, cook food and rice safely.
5. Shopping: to buy and carry food/ necessities from shops and manage money.
6. Heavy cleaning: to clean house, sweep floor and move chairs.

C. Mobility

1. Sit to stand: sit from a low plinth 43cm (17 inches) high.
2. Stand to sit: sit to a low plinth 43cm (17 inches) high.
3. Bed to chair: from lying to chair with back support and arm rests, seat 43cm (17 inches) high.

4. Indoor mobility: moving within home for a distance of 5m with turning both sides in walking.
5. Upstairs: walking up a staircase of 8 steps (each 15cm/6 inches high) with handrail.
6. Down stair: walking down a staircase of 8 steps (each 15cm/6 inches high) with handrail.
7. Outdoor mobility: to cover a distance of 50m and to include going through a door.
8. Public transport: travel on public vehicles.

D. Mental status (modified abbreviated mental test)

Recall of personal information

1. Age (± 5 yr.): How old are you now?
2. Birthday: When is your birthday? (month, date)

Orientation to time

3. Time: What is the time now? (morning, afternoon, night)
4. Year (± 1 yr.): What is the year now?

Orientation to place

5. Place name: type of place sufficient (park, market, hospital/clinic, home)

Orientation to person

6. Recognition of 2 persons: any 2 around; name or relationship eg. daughter, nurse, doctor.

Memory

7. Name a leader: any national leaders in China, past or present.
8. Mid-autumn festival: date in Chinese calendar.

Attention/Concentration

9. Count 20 to 1 backwards: (demonstrate by counting 10 to 1)

New learning

10. 5-minute recall of an address: 42 Shanghai Street; this should be repeated by the patient to ensure that it has been heard correctly.

Scoring:

For assessment of new cases, take the higher score of the first 2 visits to allow for impaired performance at the first visit due to new environment/ fatigue, etc.

Physical assessment (Parts A, B, C)

Score 0 (Dependent): patient can't participate; 2 or more manual assistance required.

Score 1 (Assistance): one manual assistance.

Score 2 (Supervision): verbal prompting/instruction, standby

Score 3 (Independent): with or without physical aids.

**All aids supplied or recommended to be stated on the form.*

Mental assessment (Part D)

Score 0 : Incorrect answer.

Score 1 : Correct answer.

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TRADITIONAL CHINESE WISDOM

A happy old man from the saying of Lie Zi

"A 100-year-old man, when asked why he was so happy while he had to work in the field in a cold spring, replied: 'Firstly, I could live to this age because I wouldn't press myself hard for achievement and I enjoyed my life when young. Secondly, I have outlived my wife and children so that I need not worry about my beloved. Thirdly, my death, which is part and parcel of life, is near. Who can tell that I won't enjoy my death as much as I was born?'"

林類年且百歲，底春被裘，拾遺穗于故畦，並歌並進。……子貢曰：“先生少不勤行，長不競時，老無妻子，死期將至，亦有何樂而拾穗行歌乎？”林類笑曰：“吾之所以為樂，人皆有之，而反以為憂。少不勤行，長不競時，故能壽若此。老無妻子，死期將至，故能樂若此。”子貢曰：“壽者人之情，死者人之惡。子以死為樂，何也？”林類曰：“死之與生，一往一反。故死于是者，安知不生于彼？故吾知其不相若矣，吾又安知營營而求生非惑乎？亦又安知吾今之死不愈昔之生乎？”

Comments

This Taoist view of way of life and death may explain the resistance of Chinese elderly people towards invasive intervention when they are ill.

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