

Effectiveness of a Finnish geriatric inpatient assessment

Two-year follow up of a randomized clinical trial on community-dwelling patients

Pertti Karppi¹ and Reijo Tilvis²

¹Central Finland Health Care District, ²University of Helsinki, Finland

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Objective – To determine whether need for services could be reduced and functional status and satisfaction improved by assessing and rehabilitating aged patients on a geriatric inpatient ward.

Design – A randomized clinical trial with a two-year follow-up.

Setting – Geriatric unit with 8 beds in a Finnish central hospital.

Patients – 312 selected community-dwelling patients were assigned to the intervention group (N = 104) and the control group (N = 208).

Interventions – The intervention patients were individually assessed and rehabilitated in a geriatric ward. The control group received usual home care.

Main outcome measures – Services, institutionalization, mortality, ADL, IADL and satisfaction.

Results – At one year, the intervention group had fewer days in health centre hospitals than controls (13.7 vs. 22.7), but only the intervention group had the geriatric inpatient stay (16.5 days). No significant differences were found for cumulative institutionalization or mortality over 24 months. At three months, the intervention group experienced a more positive change than controls in continence (P < 0.05), housekeeping (P < 0.05) and satisfaction (P < 0.01).

Conclusion – The effectiveness of comprehensive geriatric inpatient assessment and rehabilitation on community-dwelling patients is mild. More targeting and more follow-up interventions are needed.

Key words: geriatric assessment, aged, effectiveness of care, community-dwelling patients.

Pertti Karppi, MD, Geriatric Unit, Kinkomaa Hospital, FIN-40930 Kinkomaa, Finland.

Assessment and rehabilitation of geriatric patients is an increasing challenge to modern health care systems. The cost effectiveness of such programmes has become an important issue in geriatric literature and subject to controlled clinical trials. A few studies have been published on the effectiveness of geriatric inpatient assessment and rehabilitation, but the results have been varying and partly conflicting.

Treatment in the geriatric unit has reduced subsequent rates of mortality and institutionalization (1,2). Hospital costs have decreased (3,4). Treatment of selected elderly patients in a specialized unit has also improved function, but has required extra investments (5,6). Slight improvement in emotional function has been reported (7). In the only study outside the U.S.A the number of drugs was reduced after the geriatric unit stay (8).

In Finland, geriatric units have been developed for assessment and rehabilitation of community-dwelling aged patients. The effectiveness of inpatient geriatric care has not yet been studied on such a target population.

The present trial was designed to find out whether assessment and rehabilitation of a selected group of aged patients in a specialized geriatric inpatient ward could reduce the need for services and long-term care institutionalization, while improving general health, functional status, and satisfaction with care.

Patients and methods

Setting

This study was conducted in the geriatric unit of Jyväskylä Central hospital, Finland. Subjects were enrolled over a one-year period ending September 1991.

Selection of patients

The total population of the catchment area was 250 000, 13.7% of whom were aged 65 or more. The target group consisted of the supervised home care patients (N=3344), the number of those aged 65 or more was 2923, i.e. 8.5% of that age group in the whole population.

The inclusion criteria were age 65 or more, and multiple problems, e.g. several diseases, polypharmacy or problems coping at home. In addition, the general practitioners (GPs) and home nurses should regard such patients as potential candidates to benefit from the geriatric intervention. The exclusion criteria were terminal care, acute disease or injury better treatable elsewhere than in the geriatric unit, a severe long-term psychosis, and care in the geriatric unit during the past year.

The patients were stratified in groups of three according to the local area, gender and age (difference maximally 5 years). Using closed envelopes, each triplet was randomized into one intervention patient and two controls. All 312 patients were assigned to the intervention group (N=104) and the control group (N=208). Eleven patients of the intervention group refused to participate.

Intervention

The geriatric unit had eight beds in a joint ward with an additional eight beds for the rehabilitation unit. The ward personnel consisted of one doctor, five nurses, seven auxiliary nurses, three assistants, one secretary, one psychologist, one occupational therapist, two physiotherapists, and one part-time social worker. Specialists were consulted when needed. A psychiatrist visited the ward regularly once a week.

Medication changes were made in all cases and 60% of the patients availed themselves of specialist consultations. Each patient was given a rehabilitation plan to be followed at home.

The control group received the usual home care with no geriatric consultations.

Flow of the study

The patients were collected in stratified groups of three patients. Each triplet had the baseline evaluation. Then the patients were randomized. The patients were reassessed two weeks after the geriatric unit stay and one year after the randomization.

Outcome measures

The social and medical services needed by the patients were monitored during the first follow-up year. Deaths and long-term care institutionalization were carefully registered during two years.

The baseline evaluation and the first and second follow-up evaluations consisted of the GP's and home nurse's assessments. At baseline, all the patients were interviewed by the researcher and they were asked to sign a consent form. This interview consisted of demographic and psychosocial information, the Katz Activities of Daily Living (ADL) Index (9), the Lawton & Brody Instrumental Activities of Daily Living (IADL) test (10), the Short Portable Mental Status Questionnaire (SPMSQ) (11) and the Zung Self-Rating Depression Scale (12).

The GP's assessment included diagnoses and prescribed medications, and evaluation of walking and functional status by using the Rankin Scale (13). The GP, the home nurse, the patient, and the relative answered the same questions about the patient's general health (a 7-level scale

from 'excellent' to 'very poor'), ADL-function (a 7-level scale), symptoms, mood (a 4-level scale), and satisfaction with the patient's care (a 7-level scale).

The home nurse's assessment consisted of the Katz ADL Index (9) and the Lawton & Brody IADL test (10) by observing the patients. The home nurse assessed walking indoors and outdoors and checked all the equipments of the patient's home. She also interviewed the patient and the relative.

The geriatric ward used help need assessment that is widely used in the Nordic countries (14). The cognitive ability was evaluated using the SPMSQ (11).

Statistical analysis

The data were analysed using the intention-to-treat approach. The differences between the groups were tested with Student's t-test (BMDP3D) and chi-square test (BMDP4F). The effects of treatment were tested with an analysis of variance for repeated measurement (BMDP4IV) and/or with paired t-test.

Ethical issues

The study plan was approved by the local ethics committee. Consent was requested from patients participating in the trial.

Results

Comparability of the groups

At baseline there were no significant differences between the intervention and control groups (Table I).

Outcomes at hospital discharge

The average length of stay of 93 patients on the geriatric ward was 18.5 days (± 7.4 days). The patients were characterized by a diversity of main diagnoses. The commonest were depression, diabetes, ischaemic heart disease, and dementia. Three fourths of the patients were regarded as having received some help for their problems. Some improvement in function was achieved, be-

Table I. Baseline variables in 104 intervention patients and in 208 controls.

Variable	Intervention group (N=104)	Control group (N=208)
Age (years, mean \pm SD)	78.5 \pm 4.3	78.2 \pm 4.7
Sex (% female)	78	78
Marital status (% married)	24	25
Symptoms disturbing everyday life (% of patients)	70	66
Cared for in a central hospital during the past year (% of patients)	26	32
Number of prescription medications (mean \pm SD)	5.7 \pm 2.1	5.4 \pm 2.2
Independence in Katz ADLs (scale 0-6, mean \pm SD)	5.1 \pm 1.0	5.3 \pm 1.0
Independence in Lawton & Brody IADLs (scale 0-8, mean \pm SD)	4.9 \pm 1.5	5.1 \pm 1.5
Number of wrong answers in SPMSQ (scale 0-10, mean \pm SD)	1.6 \pm 1.6	1.3 \pm 1.5
Zung depression score (scale 20-80, mean \pm SD)	36.4 \pm 8.1	36.9 \pm 7.9

There were no statistical differences between the two groups.

cause the help need decreased from 4.1 (± 4.5) (scale 0-37) to 3.6 (± 4.4) ($P < 0.01$). SPMSQ mistakes decreased from 1.2 (± 1.9) (scale 0-10) to 1.0 (± 1.7) ($P < 0.05$). The number of medications did not decrease significantly.

Outcomes during the follow-up

There was only one significant difference between the groups in need for services over the first follow-up year (Table II). The intervention group stayed 13.7 (± 23.1) days in the health centre hospitals, while the control group needed 22.7 (± 42.4) days ($P < 0.05$). However, the intervention group stayed an additional 16.5 (± 7.9) days in the geriatric ward. In the monitored services used over the second follow-up year there was no significant difference between the two groups (Table III).

There was no significant difference in the cumulative long-term care institutionalization or

Table II. Services needed by the intervention and control groups during the first follow-up year (mean \pm SD).

Variable	Intervention group (N=104)	Control group (N=208)
Visits to GPs	4.5 \pm 4.2	4.6 \pm 4.5
Home visits by GPs	1.2 \pm 1.6	1.2 \pm 1.6
Visits to private doctors	0.2 \pm 1.6	0.3 \pm 0.8
Outpatient visits to special hospitals	0.8 \pm 1.3	0.6 \pm 1.2
Days in health centre hospitals	13.7 \pm 23.1	22.7 \pm 42.4*
Days in central hospitals (excl. days in the geriatric unit)	5.1 \pm 13.9	4.4 \pm 10.4
Days in the geriatric unit	15.5 \pm 7.9	0
Days in regional hospitals	3.4 \pm 23.7	1.3 \pm 7.2
Days in mental hospitals	0.0 \pm 0.0	0.1 \pm 2.2
Short-term care days in nursing homes	7.0 \pm 17.3	6.7 \pm 19.8
Long-term care days in nursing homes	7.8 \pm 36.8	5.9 \pm 35.4
Days in other institutions	0.8 \pm 4.3	0.7 \pm 3.0
Visits to day hospitals	2.2 \pm 12.7	2.5 \pm 18.0
Visits to day centres	6.0 \pm 27.2	3.5 \pm 10.9
Home visits by home nurses	40.0 \pm 48.7	42.8 \pm 47.4
Home visits by home helps	101.5 \pm 167.3	99.9 \pm 164.7
Visits to home nurses	1.0 \pm 4.1	0.8 \pm 3.3

* $p < 0.05$

in the cumulative mortality over 24 months (Figure 1).

There were a few significant differences in changes of function and satisfaction at three months (Figure 2), but none at twelve months. At three months, the intervention group showed a positive change in general health ($P < 0.05$), continence ($P < 0.05$), and housekeeping ($P < 0.05$) evaluated by the home nurses, and in physical activities of daily living ($P < 0.01$) evaluated by the relatives, and in their own satisfaction with care ($P < 0.01$).

Discussion

The present study was aimed at testing whether the geriatric inpatient assessment and rehabilita-

Table III. Services needed by the intervention and control groups during the second follow-up year (mean \pm SD).

Variable	Intervention group (N=104)	Control group (N=208)
Outpatient visits to special hospitals	0.5 \pm 1.3	0.6 \pm 1.3
Days in health centre hospitals	23.6 \pm 49.4	27.2 \pm 62.0
Days in central hospitals	2.2 \pm 7.2	2.2 \pm 6.1
Days in regional hospitals	0.3 \pm 2.0	0.8 \pm 4.6
Days in mental hospitals	0.0 \pm 0.0	0.0 \pm 0.0
Short-term care days in nursing homes	7.6 \pm 26.7	7.3 \pm 24.0
Long-term care days in nursing homes	26.5 \pm 87.3	17.1 \pm 66.7

There were no significant differences between the two groups.

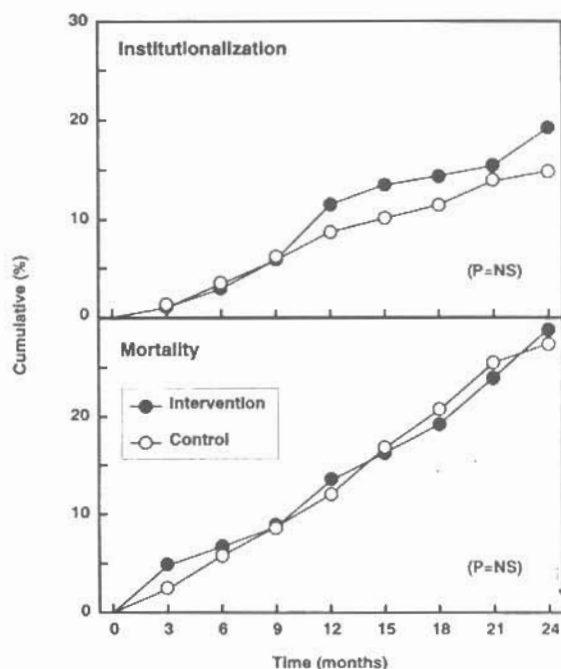


Figure 1. Cumulative long-term care institutionalization and mortality over 24 months for intervention and control group. There were no significant differences between the groups (NS = Non-significant).

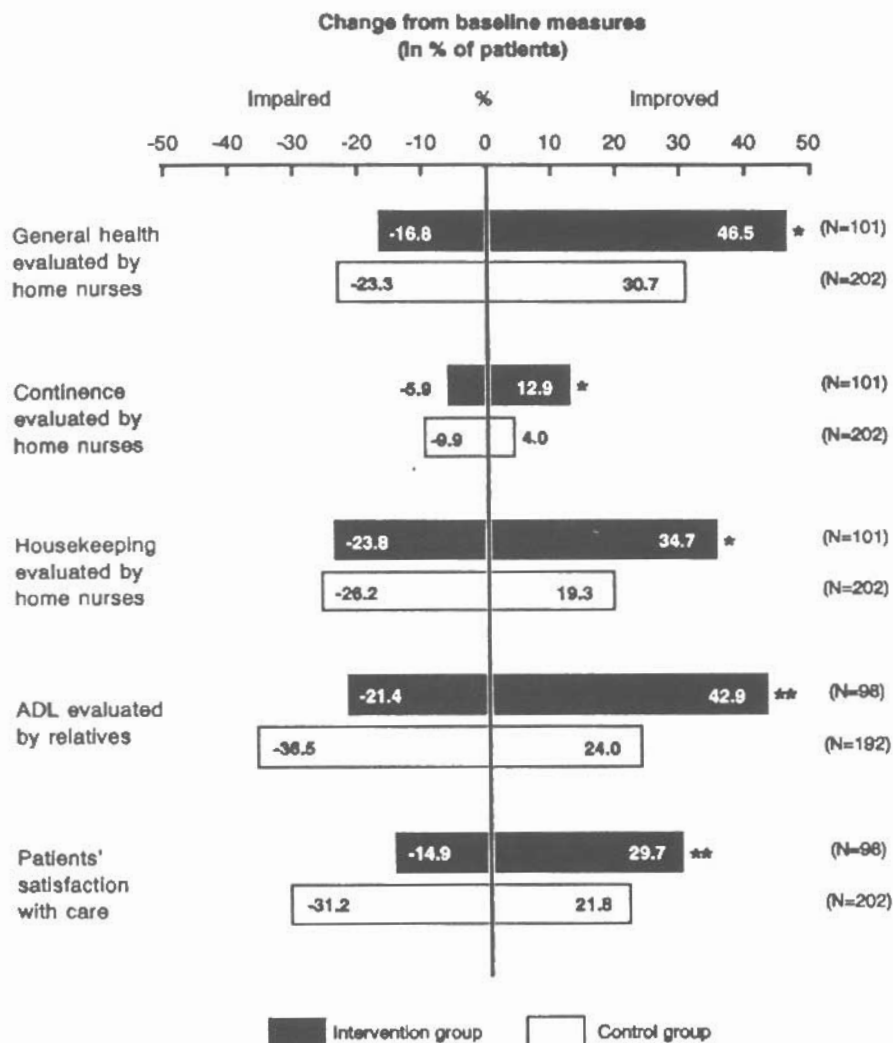


Figure 2. Statistically significant differences in changes between the two groups over the first three months (in % of patients). Asterisks indicate differences between intervention versus control (* $P < 0.05$, ** $P < 0.01$).

tion indicated any changes in need for services and in functional status compared with the usual ambulatory care in health centres. Viable comparisons with previous studies are hampered by the different cultures and systems involved.

The functional status of the patients was improved shortly after the geriatric unit stay, but the results were rather mild. The better continence could be important to the patients. The improved housekeeping may be explained through the holistic activation. The same thing may be reflected in the ADL-ability evaluated by the relatives. The

positive change in satisfaction with care may partly depend on the controls' disappointment at not being invited to the geriatric unit. The opinion of the home nurses about the general health should be viewed with reservations, because the present study was not blind.

Small benefits were registered at three months, but not at twelve months. This may indicate that more emphasis should have been put on further control and interventions after the geriatric hospital care.

The cumulative mortality in the present study

was low, about 13% one year and 28% at two years. In one study (1) there was 15% mortality even during the geriatric unit period and at one year the cumulative mortality was 24%; at two years the corresponding value was 36% (2). Yet another trial (5) had a one-year mortality of 19%. Accordingly, our patients must have been much healthier.

The targeting was problematic. It can be queried if it was right that the GPs and home nurses selected the patients according to the inclusion and exclusion criteria. The results might have been different if the patients could have been selected by the geriatric unit according to more detailed and strict criteria, perhaps outside the home care population, e.g. patients having a lower functional level or wait-listed to long-term care institutions. There were two reasons to target in the way chosen: i) in Finland it has been assumed that this kind of a community-dwelling patient group might be a good target for geriatric interventions; ii) it was also an ethical compromise solution approved by the GPs and the ethics committee.

More specified targeting is needed. It seems as if more acutely ill patients should be assessed and rehabilitated in an inpatient geriatric unit. The home care population should not be the main source of patients. More attention should be given to further interventions after the geriatric inpatient stay. Different models of geriatric care should be further studied.

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