Treatment of patients with acute stroke in stroke units (with or without early supported discharge)

This is an excerpt from the full technical report, which is written in Norwegian.

The excerpt provides the report's main messages in English.

No. 18–2010

Health technology assessment (HTA)

kunnskapssenteret

Title	Treatment of patients with acute stroke in stroke units (with or without early supported discharge)
Norwegian title	Behandling av pasienter med akutt hjerneslag i slagenheter (med og uten tidlig støttet utskriving)
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ISBN	978-82-8121-354-8
ISSN	1890-1298
Report	No. 18 – 2010
Project number	561
Type of report	Health Technology Assessment
No. of pages	51 (74 incl. attachments)
Client	The Norwegian Directorate of Health
Subject heading (MeSH)	Stroke; Rehabilitation; Stroke Rehabilitation; Patient Discharge; Cost-Benefit Analysis; Economics, Medical
Keywords	Acute treatment; stroke unit; early supported discharge; economic evaluation; cost effectiveness
Citation	Hamidi V, Wisløff T, Ringerike T, Linnestad KK, Harboe I, Klemp M. Treatment of patients with acute stroke in stroke units (with or without early supported discharge). Report from Kunnskapssenteret no. 18–2010. Oslo: Norwegian Knowledge Centre for the Health Services, 2010.

Norwegian Knowledge Centre for the Health Services summarizes and disseminates evidence concerning the effect of treatments, methods, and interventions in health services, in addition to monitoring health service quality. Our goal is to support good decision making in order to provide patients in Norway with the best possible care. The Centre is organized under The Norwegian Directorate for Health, but is scientifically and professionally independent. The Centre has no authority to develop health policy or responsibility to implement policies.

We would like to thank all contributers for their expertise in this project. Norwegian Knowledge Centre for the Health Services assumes final responsibility for the content of this report.

Norwegian Knowledge Centre for the Health Services
Oslo, June 2010

Key messages (in English)

Background

Stroke is the third most common cause of death, a major cause of severe disability in Norway and accounts for considerable amounts of healthcare resources. The organization of treatment and rehabilitation of stroke patients may improve functional outcomes and enhance quality of life for individuals with acute stroke.

Task requirement

Norwegian Directorate of Health's development group for the preparation of national clinical guideline for stroke has commissioned Norwegian Knowledge Centre for the Health Services to conduct economic evaluations of some central recommendations in the stroke guideline. We evaluated the clinical efficacy and conducted health economic model analyses of stroke unit care compared with stroke unit care followed by early supported discharge or general medical ward care.

Main Results

- Ordinary stroke unit care is associated with probably lower mortality than care in general medical wards, whereas there is possibly little or no difference between the two strategies for moderate or severe sequelae.
- The results of the meta-analyses of comparison between two different stroke units (with and without early supported discharge) show possibly little or no difference in mortality and dependency with care in stroke unit with early supported discharge.
- The economic evaluation found that ordinary stroke unit care dominate the care in the general medical ward because it has lower expected cost and higher expected quality-adjusted life years.
- Stroke unit care followed by early supported discharge reduces lifetime costs and adds quality-adjusted life years compared with ordinary stroke unit care.
- The sensitivity analyses indicate that stroke unit care followed by early supported discharge most likely is the most cost-effective strategy.

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What kind of report is this?

Health technology assessment (HTA)
A HTA is the result of a systematic review of research-based knowledge with at least one of the following addition: health economic evaluation, assessment of the ethical, legal and / or organizational and social consequences.

This report includes:

Full text studies that met inclusion criteria described on p.23

Not included:

Studies that did not meet inclusion criteria

Who produced it?

The Norwegian Knowledge Centre for the Health Services on Behalf of the Norwegian Directorate of Health

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When was the literature search done?

Latest search for studies: September 2009.

Executive summary (in English)

Treatment of patients with acute stroke in stroke units (with or without early supported discharge)

BACKGROUND

In Norway stroke affects approximately 15,000 people annually. Stroke is the third most common cause of death, a major cause of severe disability and accounts for considerable amounts of healthcare resources. The organization of treatment and rehabilitation of stroke patients may improve functional outcomes and enhance quality of life for individuals with acute stroke.

Stroke unit

Stroke unit is defined as a geographic location within the hospital dedicated to the management of stroke patients. Care of stroke patients is provided by a multidisciplinary and specially trained team with standardised protocols and guidelines for diagnostic, evaluation, observation, acute treatment and early rehabilitation. World Health Organization, Region Europe, has recommended that all stroke patients should be admitted to organised stroke units.

Early discharge and home follow-up

The essential elements of early supported discharge are initial treatment in a stroke unit combined with early supported discharge coordinated by a mobile stroke team, cooperation with the primary healthcare system, and greater emphasis on rehabilitation at home. The concept behind this is to optimize recovery for patients to return them to an active life at home as soon as possible.

The objective of this analysis is to evaluate the clinical efficacy and to conduct health economic analyses of treating acute stroke patients in stroke units which combine acute treatment and early rehabilitation compared with treating patients in 1) stroke unit followed by early supported discharge and 2) conventional care (general medical wards) without early supported discharge.

METHODS

This report was conducted as a health technology assessment. This report comprises a systematic review of the literature on clinical efficacy as well as a health economic analysis of stroke unit care compared with stroke unit care followed by early supported discharge or general medical ward care.

We searched for systematic reviews and randomized controlled trials in relevant bibliographic databases. Two persons went through all the titles and abstracts and selected the articles independently. We ordered relevant systematic reviews and primary articles in full text, assessed the quality using checklists and graded the overall documentation. We have made separate meta-analysis for each comparison.

Health economic evaluation were done in NorCaD (developed by Norwegian Knowledge Centre for the Health Services and University of Oslo), a Markov-model based on Norwegian incidence data and treatment costs. The model calculated quality-adjusted life years and life years gained with different strategies and life time costs related to stroke. The model was run on 70-year-old men with average risk of further cardiovascular diseases. We also analysed males at 50 years of age and females at both 50 and 70 years of age. The patients were followed until death or 100 years of age.

Quality of life data were taken from a British HTA-report. The costs of the different alternative strategies were based on a Norwegian study of stroke units. In addition, we performed sensitivity analyses to get an impression of uncertainty surrounding our analyses.

RESULTS

The overall documentation of the efficacy of stroke unit care compared with stroke unit care followed by early supported discharge and general medical ward care was based on two relevant systematic reviews of high quality and a randomized controlled trial with low risk of bias. The results showed that care in ordinary stroke unit resulted in significantly lower mortality than care in general medical ward, whereas there was no significant difference between the two strategies for moderate or severe sequelae. The results of the meta-analysis of comparison between two different stroke units (with and without early discharge) showed, however, a non-significant decrease in mortality and dependency with care in stroke unit with early supported discharge.

Results from our health economic model showed that care in ordinary stroke units provided 0.33 additional quality-adjusted life years (QALYs) and reduced lifetime costs for the health care system with NOK 337,000 compared with care in general

medical wards. Hence, stroke units are dominant strategy compared to medical wards.

Stroke units with early discharge resulted in a QALY gain of 0.17 and reduced lifetime costs (NOK 127,000) compared with ordinary stroke units, and hence stroke units combined with early supported discharge is a dominant strategy compared to ordinary stroke units.

Probabilistic sensitivity analyses showed that care in stroke units followed by early supported discharge is the most cost-effective strategy in 88 % of the simulations, while care in ordinary stroke units was the most cost-effective in 12 %, assuming willingness-to-pay per QALY of NOK 500,000. The results also showed little sensitivity with gender and age variation.

We have also conducted analyses with cost per life year gained. The results showed that the incremental effect was 0.29 life years in favour of stroke units compared with the general medical wards. Similarly, the life year gained was 0.11 life years in favour of stroke unit with early supported discharge relative to ordinary stroke unit. In both comparisons, however, costs were lower, which do not change the assumption that both comparisons are dominant.

DISCUSSION

The quality of the efficacy documentation varied from moderate to low. This entails that there is a possibility that future research will affect our confidence in the estimate of effect and that future estimates may be different.

The limitations of our analysis comprise the fact that the transition probabilities in the model are based on sources from different countries and of different types. Furthermore, all events and conditions in the model have been chosen from where the primary prevention was the main focus.

CONCLUSIONS

Care in ordinary stroke units resulted in probably lower mortality than care in general medical wards, whereas there was possibly little or no difference between the two strategies for moderate or severe stroke sequelae. The comparison of two different stroke units (with and without early discharge) showed possibly little or no difference in mortality and dependency with care in stroke units with early supported discharge.

Based on our health economic model, it appeared that ordinary stroke unit care was cost-effective relative to conventional care. Moreover, stroke unit care followed by

early supported discharge was cost-effective compared with ordinary stroke unit care.

The sensitivity analyses indicated that stroke unit care followed with early supported discharge most likely was the most cost-effective strategy. Future research on this comparison will possibly give a better picture of the relationship between these two ways of organizing stroke care.

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