

# Bobath or Motor Relearning Programme? A follow-up one and four years post stroke

**Birgitta Langhammer** Faculty of Health Sciences, Oslo University College and **Johan K Stanghelle** Sunnaas Rehabilitation Hospital, Nesoddtangen, Norway

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**Objective:** The purpose of this follow-up one and four years post stroke was to find out whether the initial physiotherapy approach had had any long-term effects on mortality, motor function, postural control, activities of daily living, life quality, follow-up from community services and living conditions.

**Design:** A randomized controlled trial of first time ever stroke patients. Group 1 ( $n = 33$ ) and group 2 ( $n = 28$ ) had initial physiotherapy according to the Motor Relearning Programme and Bobath, respectively.

**Main outcome measures:** The Motor Assessment Scale (MAS), the Sødning Motor Evaluation Scale (SMES), the Barthel ADL Index, the Nottingham Health Profile (NHP) and Berg Balance Scale were used. The following parameters were also registered: incidence of new strokes, other diseases, use of assistive devices, the patient's accommodation and use of services from the community.

**Results:** The mortality rates were similar in the two groups. In both groups the motor function, postural control and ADL had decreased rapidly, leaving many of the patients dependent and with a high risk of falling. Life quality had increased compared to the acute stage, but was still low in comparison with healthy persons. Patients in both groups lived at home, but were dependent on help from relatives and community services. Physiotherapy as follow-up service was seldom used. The initial physiotherapy approach did not seem to have a major influence on the patients' ability to cope in the long term.

**Conclusion:** This follow-up at one and four years post stroke showed no major influence of two different initial physiotherapy regimens on long-term function. The study confirmed a rapid deterioration of ADL and motor function and an increased dependence on relatives. The study reveals a gap between the intense treatment in the acute phase and little or no follow-up of physiotherapy treatment or other rehabilitation activities later.

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Address for correspondence: Birgitta Langhammer, University College of Oslo, Faculty of Health Science/Physiotherapy Programme, Pilestredet 44, N-0167 Oslo, Norway. e-mail: Birgitta.Langhammer@hf.hio.no

## Background and purpose

In a previous study on the effects of two different physiotherapy concepts/methods in the rehabilitation of acute stroke patients we found that physiotherapy with task-oriented strategies, represented by the Motor Relearning Programme (MRP), was preferable to physiotherapy with facilitation/inhibition strategies, such as the Bobath programme.<sup>1</sup> The present study presents a follow-up one and four years post stroke of the same stroke patients. We especially compared the results in the two groups with regard to the initial different physiotherapy treatments to see if there were still any group differences in the measured parameters.

## Methods

All patients ( $n = 61$ ) who agreed to participate in the first study were invited to participate in a follow-up study at Bærum Hospital outpatient clinic, with a medical and physiotherapy examination 1 year and 4 year post stroke. All patients in this study were treated for approximately one week in a stroke unit in the acute stage, thereafter in the rehabilitation unit and/or as outpatients, as reported in our previous study.<sup>1</sup>

The mortality rate was registered during the acute stage and at one and four years follow-up.

Outcome measures were Motor Assessment Scale (MAS), Sjødring Motor Evaluation Scale (SMES), Barthel ADL Index, Nottingham Health Profile (NHP) and Berg Balance Scale, as in our previous study.<sup>1</sup> In addition a semi-structured interview with six questions was carried out with each patient by a physiotherapist.

Results were analysed in a SPSS program, version 10.0, with Student's *t*-test for evaluation of group differences. A description of the procedures is presented in the first study.<sup>1</sup>

The Regional Committee of Medical Research Ethics of Norway acknowledged the study, and all patients participated voluntarily, signing a written agreement after being informed orally and in written form about the intentions of the study.

## Results

The mortality rates, one and four years post stroke, were 6/33 and 12/33 in the MRP group versus 7/28 and 12/28 in the Bobath group.

Motor function scores, measured by MAS and SMES, decreased after one year compared with the results three months post stroke (Table 1). The same decreasing tendency was seen in Barthel ADL index scores, indicating a lower level of independence in both groups (Table 1). The decreases in motor function and ADL were more pronounced and significant at four years follow-up. The scores four years after stroke were at a level similar to those of the first scores after the acute stroke, indicating a low degree of independence in ADL, motor function and transfer (Table 1). There were no significant differences between the groups in any of the tests.

The number of survivors who lived in their own home was 60% one year and 40% four years after stroke (Table 1).

The incidence of new strokes was low in both groups at one year ( $n = 2$  in the MRP group,  $n = 0$  in the Bobath group) but increased at four years follow-up ( $n = 8$ , both groups).

Follow-up treatment by a physiotherapist was rare at one year (15%/10%), and somewhat more frequent at four years follow-up (21%/31%). Many patients received substantial help from their spouse or children/relatives.

Life quality measured by Nottingham Health Profile at one year and four years follow-up showed lower scores after one year than after three months, but there was an increasing tendency in the total score till four years (Table 1). There was no significant difference between the two groups, but the difference between genders was significant, with better perceived life quality in men.

Use of assistive devices increased over the years (one year 50%, four years 60%), and few patients managed without any assistive devices (one year 28%, four years 5%). There was no difference between the groups, but there was a significant difference between genders, as women were more dependent on assistive devices than men.

The scores on the Berg Balance Scale, measured at four years follow-up, indicated poor

**Table 1** Outcomes for the MRP and Bobath groups measured on three occasions after stroke (mean/median, range and SD)

	MRP ( <i>n</i> = 33)			Bobath ( <i>n</i> = 28)		
	3 months	1 year	4 years	3 months	1 year	4 years
Number of patients	29	27	21	24	21	16
Deaths	4	6	12	4	7	12
MAS	37/42	30/37	21/26	33/39	27/36	19/17
Range	7–48	0–48	0–48	2–48	0–48	0–48
SD	12	18	21	15	20	20
SMES 1	17/20	13/16	9/12	16/19	12 /16	8/9
Range	5–25	0–20	0–20	4–20	0–20	0–20
SD	5	7	9	6	8	9
SMES 2	65/76	52/64	33/18	58/65	47/72	32/22
Range	16–80	0–80	0–80	18–80	0–80	0–80
SD	21	31	35	23	36	22
SMES 3	41/44	32/36	22/21	39/48	31/35	21/17
Range	3–60	0–60	0–60	0–60	0–60	0–60
SD	18	23	24	21	25	24
Barthel						
ADL	83/95	68/95	45/60	72/88	57/75	42/40
Range	5–100	0–100	0–100	0–100	0–100	0–100
SD	25	41	44	34	43	44
NHP	22/19	17/15	20/21	24/21	13/11	16/15
Range	0–59	0–66	0–51	0–67	0–40	0–38
SD	18	16	15	21	12	11
Living at home	17	20	13	13	14	13

MRP, Motor Relearning Programme; MAS, Motor Assessment Scale; SMES, Sødring Motor Evaluation Scale; NHP, Nottingham Health Profile.

balance with high risk of falls in both groups, on average 20 and 19 points, respectively, out of a total score of 56.

Mean age and marital status did not reveal any differences between the groups, neither at one nor at four years follow-up. There was a decrease in mean age of the patient group during the study period, from 78 years at three months to 66 years at one year and 58 years at four years. This result must be seen in combination with the high mortality rate. Many patients, *n* = 29, had developed secondary complications or additional illnesses after the stroke, such as fractures, oedema, vertigo, muscular pains and urinary problems.

## Discussion

The main findings in this follow-up study after acute stroke were the high mortality rate and the decreasing function in the survivors, independent of the physiotherapy given during the primary rehabilitation period. The mortality rate was high in both groups, indicating that stroke is a serious disease in older age.<sup>2–5</sup>

The decrease of function was larger than would be expected in the average population of old people.<sup>6</sup> We found no significant differences in the measured variables in the group treated with MRP versus the group treated with Bobath. The relatively small number of patients in the study could be one reason for this. However, it may not be reason to believe that different physiotherapy

### Clinical messages

- Patients lose functional independence progressively after initial stroke rehabilitation.
- Initial rehabilitation by Bobath or Motor Relearning Programme approaches did not have a major impact on this loss.

regimes in the initial phase after acute stroke will have a long lasting effect.

It seems that the decrease in motor function and ADL is compensated for by help from relatives and community-based services, despite the fact that this patient group in average became younger and would be expected to have had more reserves than an older stroke population.

In our study, quality of life had improved in both groups at one year and four years follow-up compared with three months, measured by NHP, but compared with healthy counterparts it was low.<sup>7-9</sup> An explanation might be that the initial crisis, in the acute stroke setting, was huge. This reaction was probably registered at the three months follow-up. After one year, or four, the patients may have accepted and adapted to the new situation and arranged their life accordingly.<sup>7,8</sup>

In general, the patients received little or no physiotherapy treatment one and four years post stroke. Although it is important to enhance motor function in the early rehabilitation period to make optimal use of the plasticity of the brain and its capacity to reorganize, the initial type of physiotherapy does not seem to have any long-term effects on ADL or motor function for stroke patients. On the other hand, in order to keep strength, endurance, and postural control, one needs regular physical training to keep a constant outcome.<sup>10,11</sup>

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