The Bobath concept in stroke rehabilitation: a focus group study of the experienced physiotherapists’ perspective

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Abstract

Purpose: The Bobath concept, usually known as neurodevelopmental treatment (NDT) in America, is one of the major approaches used to rehabilitate patients following stroke; however since the last publication of Bobath (1990), the concept has been taught via an oral tradition on postgraduate courses. This study therefore aimed to explore with experienced therapists firstly how the Bobath concept had changed since 1990, and secondly what they considered its main theoretical assumptions to be using a focus group research design.

Method: Eight peer-nominated expert physiotherapists agreed to participate in two focus groups organized according to specialist interest in either neurology (group A) or elderly care (group B). Therapists were asked to discuss six topics based on a review of published literature. Data analysis involved several readings of verbatim transcriptions, from which key themes and concepts were developed.

Results: All therapists agreed on the following core themes defining Bobath: analysis of normal movement, control of tone and facilitation of movement. Neuroplasticity was described as the primary rationale for treatment with therapists using affirment information to target the damaged central nervous system. In addition group A discussed motor learning, whereas group B discussed patient focused goals and relating treatment to function.

Conclusions: This study highlighted changes in theory, terminology, and techniques. Tone remained a major problem in the rehabilitation management of the hemiplegic patient; however much attention was also directed towards the musculoskeletal system. Both facilitation of normal movement components and task specific practice using specific manual guidance were considered critical elements of the Bobath concept. For Bobath therapists, physiotherapy has an important impact on both the performance components of movement and functional outcomes. In view of the small numbers involved in this preliminary study, further studies are now needed to determine if these themes and concepts are congruent with the majority of physiotherapists’ interpretation of the Bobath concept in stroke rehabilitation.

Introduction

The Bobath concept, usually known as neurodevelopmental treatment (NDT) in America, is one of the major approaches used to rehabilitate patients following stroke. It aims to re-educate the hemiplegic side by focusing on regaining normal movement; it evolved from the Bobaths’ clinical observations of both normal and abnormal movement in individuals with central nervous system damage. Much of the theoretical rationale was derived from neurophysiological research in the 1950s based on a hierarchical model of motor control. While proponents of the Bobath concept maintain that the concept has since evolved to take into account recent advances in motor control (and in particular the work on neuroplasticity), there is very little published evidence to suggest that the Bobath concept has changed.

Indeed, to date there is no published evidence to support the value of any particular treatment approach in stroke rehabilitation over another. A previous paper has reviewed the literature concerning the theoretical basis of physiotherapy using the Bobath concept in stroke rehabilitation. This paper identified the key assumptions which guide current practice as: neuroplasticity shaped by manipulation of afferent inputs; a systems theory of motor control; neurophysiological dysfunction as the primary cause of movement dysfunction, and the relearning of normal movement through experience with active participation of the patient.

Although the Bobath concept is widely used clinically, controversy exists over what precisely constitutes Bobath practice and how such treatment is actually delivered in

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practice. Royeen and De Gangi (1992) reviewed all studies related to NDT and found that few of these reports actually described in detail the Bobath intervention used. At another level three postal based surveys have been undertaken to determine current clinical practice in stroke rehabilitation. While these have all provided a comprehensive profile of respondents and service delivery; therapists responding to these surveys were still unable to provide a theoretical rationale for treatment. This may be due to the way in which theoretical beliefs were explored i.e. using a case study vignette. The majority of respondents stated that they did not have adequate information upon which to base treatment recommendations; rather they indicated that they would need to observe and feel what was happening with the patient presented in the vignette. Sackley and Lincoln (1996) supplemented their survey with semi-structured interviews; this enabled them to probe the therapists’ rationale for choosing Bobath based treatment over a functional approach. In their study therapists chose the Bobath concept when normal movement, quality of movement and prevention of spasticity were prime concerns.

Shepherd (1991) has emphasized the importance of subscribing to an explicit theoretical framework in order to evaluate practice and highlighted that the treatment strategies that therapists select are based on their theoretical beliefs. For example if the therapist believes that abnormal tone is hampering the patient’s movement, he/she will attempt to normalize the tone in order to improve the patient’s movement patterns. Therefore in order to evaluate treatment effects, the key theoretical assumptions underlying practice also need first to be examined.

This study therefore aimed to explore with experienced therapists what they perceived the theoretical basis of the Bobath concept to be and how it had changed since Bobath’s last publication on adult hemiplegia in 1990. A qualitative research design was chosen for this study as neurological physiotherapy based on the Bobath concept is based upon accumulated clinical observations and experiences; therapists do not easily articulate which theoretical beliefs they are using to guide intervention.

Method

The focus group is used discover information about why people think or feel the way that they do. Focus groups are used to get closer to the participants’ perspective and understanding through group interaction; this allows the researcher to remove his/her interaction with the participants, as there is a low level of researcher involvement. Focus groups may also yield ‘volunteered’ data as opposed to ‘requested’ data. The researcher had encountered both these difficulties in two pilot interviews with individuals: therapists did not volunteer data but simply responded to the questions asked and it was difficult to avoid a high level of interaction between the interviewer and the interviewee, both of whom were experienced neurological therapists.

The ideal size of focus groups varies between four to eight people; the number of groups can vary. As the results of this study were to be used to formulate appropriate questions and statements for a future, large scale survey, the researcher restricted the number of focus groups by recruiting therapists of similar expertise from two main areas of specialist stroke care: neurology and elderly care. An invitation to participate in the study was sent to twelve therapists identified as expert practitioners by the committee members of two specialist interest groups (Association of chartered physiotherapists with an interest in neurology (ACPIN) and physiotherapists interested in the care of older people (AGILE)). Five out of six therapists from group A (ACPIN) agreed to participate, including one qualified and one trainee Bobath tutor; however the trainee was unable to attend the group A session on the date organised, but agreed to be interviewed on an individual basis (therapist C) prior to focus group A. Four out of six therapists agreed to participate from AGILE (group B); however only three were able to attend on the day. Exactly the same procedures were used for all participants. Therapist C was interviewed three days prior to focus group A. Group A and group B were held two weeks apart. All participants were specifically requested not to discuss the sessions with their colleagues in order to avoid contamination of the data.

Topics for discussion were prepared in advance based upon a recent review concerning the Bobath concept and two unpublished pilot surveys which had aimed to identify current physiotherapy practice in stroke rehabilitation. These topics, presented on slides to each focus group, are summarized in table 1. Each topic consisted of a quote from published literature followed by some key headings.

Members of the group were well known to each other and seated in a circle. The purpose of the group was first explained, after which written consent was obtained from all participants; therapists were then asked to complete a brief questionnaire on their background. The session was audio taped; the moderator started audio recording, introduced the session, then proceeded to ask the group to discuss how the Bobath concept had evolved since the last publication by Bobath (1990).
The Bobath concept

Table 1  Focus Group Topics presented on individual acetates for overhead projection

1. How has the Bobath concept evolved since Bobath (1990)?

2. The main problems of the hemiplegic patient are the abnormal coordination of movement patterns combined with abnormal postural tone; problems of strength are seen as secondary (Bobath 1990).
   - reflex inhibiting patterns
   - key points: proximal vs. distal; postural sets
   - neurodevelopmental sequence
   - mass patterns/abnormal synergies
   - normal movement on a volitional or an automatic basis
   - facilitatory techniques: icing, vibration, tapping, stroking etc.

3. The main aim of physiotherapy using the Bobath concept is to re-educate normal movement. The therapist usually works on the patient’s ability to recover balance against gravity first, the patient may then progress to making selective movements (Lynch and Grisogono 1991).
   - re-educating vs. facilitating
   - balance before selective control
   - righting/equilibrium reactions
   - function

4. The general aims of treatment are: to normalise tone, to determine which abnormal patterns need to be inhibited and to decide which normal movement components need to be facilitated. The therapist prepares the patient for functional skills by focusing on the components of normal movement essential to functional activity (Bohman 1987).
   Essential components of normal movement
   - trunk mobility & control (A/P/L pelvic tilt)
   - movement of the pelvis on the thorax (elongation/side flexion)
   - shoulder girdle mobility
   - head control
   - midline orientation
   - weight shift (? weight transference)
   - selective movement of the limb

5. Current theoretical assumptions underlying the Bobath concept (Lennon 1996).
   - recovery of function based on neuroplasticity
   - a systems model of motor control of the CNS
   - neurophysiological dysfunction is the primary cause of movement dysfunction
   - the relearning of normal movement with active participation of the patient
   - manipulation of a variety of afferent inputs (mainly proprioceptive)

6. Theoretical statements.
   1. Recovery of movement from stroke follows a predictable sequence that mimics the normal developmental sequence of maturing infants.
   2. Recovery of movement occurs first proximally, then distally
   3. Treating proximal instability encourages the return of selective control distally in the limbs
   4. Facilitating the components of normal movement will automatically lead to improvement in functional tasks
   5. Functional tasks are incorporated into physio sessions
   6. Patients should be given activities to practice outside therapy
   7. Walking aids are used as a last resort in treatment
   8. Orthotics are used as a last resort in treatment

Analysis

The methods described by Krueger (1994) were adopted for analysis. The audiotapes were transcribed by the departmental secretary and searched by the investigator for the main emerging ideas. All participants were assigned a code to ensure anonymity in the transcript. The data was coded by identifying the key theme by page, paragraph number and participant on an index card under each discussion topic. Illustrative quotes were identified by page and paragraph number on the back of the index card.

Following the verbatim transcription, a two to three page descriptive statement was prepared for both groups and therapist C, summarizing the key ideas of the discussion supported by illustrative quotes from the participants. This was forwarded to each participant along with the full transcript to agree the record of the discussion. Minor amendments to the wording of some statements were identified by two out of eight participants; all participants agreed with the themes identified.

Participants in the focus group were peer nominated from specialist interest groups including one qualified Bobath tutor and one trainee tutor; this ensured that the participants were considered to have expertise in the
Bobath concept. Reliability of the data extraction was ensured by gaining corroboration of the interpretation from participants, all of whom had access to both the descriptive summary statement and the full transcript.

RESULTS

Details of the therapists are included in table 2. All therapists had attended both a basic and an advanced Bobath course, the most recent course within the past 3 years. Experience in stroke rehabilitation varied from 5–15 years with an average of 9.4 years experience. Five of the eight participants considered themselves to be ‘purist’ meaning that their approach to patient management was not influenced by any other major treatment approach. Both groups discussed the evolution of the Bobath concept and the key principles for about the first ninety minutes of the session. Group B were less spontaneous in their responses to topics 2 to 6, providing in a number of cases essentially ‘yes’ or ‘no’ answers with occasional prompting by the moderator. In comparison to group A and therapist C, much of group B’s discussion centred around patient focused goals and relating treatment to function; the others were more inclined to discuss issues related to neurophysiology.

Therapist C (the trainee tutor in one-to-one interview) answered the question about the evolution of the Bobath concept succinctly, identifying two main changes: the therapist’s ability to analyse normal movement resulting in more skilled treatment, and a deeper understanding of relevant neurophysiology giving a better basis for treatment. Beyond this, the majority of her interview time was spent discussing topics 2 to 5.

Table 2 Profiles of participating therapists

<table>
<thead>
<tr>
<th>Participant</th>
<th>Yrs qualified</th>
<th>Yrs of experience with stroke</th>
<th>Setting</th>
<th>‘Purist’ Bobath</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>13</td>
<td>10</td>
<td>Young Disabled Unit (YDU)</td>
<td>Yes</td>
</tr>
<tr>
<td>A2</td>
<td>15</td>
<td>13</td>
<td>YDU</td>
<td>Yes</td>
</tr>
<tr>
<td>A3</td>
<td>7</td>
<td>5</td>
<td>YDU</td>
<td>Yes</td>
</tr>
<tr>
<td>A4</td>
<td>15</td>
<td>15</td>
<td>Community</td>
<td>Yes</td>
</tr>
<tr>
<td>B1</td>
<td>12</td>
<td>10</td>
<td>Community Stroke Scheme (CSS)</td>
<td>No</td>
</tr>
<tr>
<td>B2</td>
<td>8-5</td>
<td>5</td>
<td>CSS</td>
<td>No</td>
</tr>
<tr>
<td>B3</td>
<td>10-5</td>
<td>7</td>
<td>Stroke Unit</td>
<td>No</td>
</tr>
<tr>
<td>C</td>
<td>12</td>
<td>10</td>
<td>Neurology ward</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Table 3 Key themes regarding the Bobath concept across groups

<table>
<thead>
<tr>
<th>Themes</th>
<th>Concepts</th>
<th>Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analysis of normal movement</td>
<td>neuroplasticity</td>
<td>A,B,C</td>
</tr>
<tr>
<td></td>
<td>postural sets/key points</td>
<td>A,B,C</td>
</tr>
<tr>
<td></td>
<td>alignment (integration of musculoskeletal system)</td>
<td>A,B,C</td>
</tr>
<tr>
<td>Control of tone</td>
<td>normalisation of tone</td>
<td>A,B,C</td>
</tr>
<tr>
<td></td>
<td>preparation for activities</td>
<td>A,C</td>
</tr>
<tr>
<td></td>
<td>associated reactions</td>
<td>A,C</td>
</tr>
<tr>
<td>Facilitation of movement</td>
<td>patient activity</td>
<td>A,B,C</td>
</tr>
<tr>
<td></td>
<td>automatic &gt; volitional movement</td>
<td>A,B,C</td>
</tr>
<tr>
<td></td>
<td>use of afferent inputs (manual &gt; visual/verbal)</td>
<td>A,B,C</td>
</tr>
<tr>
<td></td>
<td>functional activity</td>
<td>A,B,C</td>
</tr>
<tr>
<td></td>
<td>goal setting</td>
<td>A,B,C</td>
</tr>
<tr>
<td>Motor Learning</td>
<td>re-accessing &gt; re-learning</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>practice of components vs. tasks</td>
<td>A,B,C</td>
</tr>
<tr>
<td>A broad concept</td>
<td>techniques from other approaches</td>
<td>A,B,C</td>
</tr>
<tr>
<td></td>
<td>use of orthotics and walking aids</td>
<td>A,B,C</td>
</tr>
<tr>
<td></td>
<td>experience helped with treatment planning</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Influence of the treatment setting</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>value of teamwork</td>
<td>B</td>
</tr>
</tbody>
</table>

The key ideas that emerged from each group are identified in table 3; from this, it is clear that all therapists agreed on the following core concepts defining Bobath: analysis of normal movement, control of tone and facilitation of movement. Group A also discussed motor learning. Group B discussed the value of experience, teamwork and the influence of the treatment setting. Each theme with its associated concepts is considered in the following text.

Analysis of normal movement

The concepts promoted within this theme were: neuroplasticity, postural set analysis and alignment. In the past, neurological therapy had progressed adult patients by working through the neurodevelopmental milestones adopted by children as their motor skills improved. Group A emphasized that normal movement and neuroplasticity were now recognized as the basis of practice, as opposed to normal child development. Neuroplasticity referred to the ability of the adult’s central nervous system to change following damage; these changes could be either positive or negative depending on the information that the patient received from the environment and the way in which they were handled or encouraged to move:
The Bobath concept

You are trying to get the patient to move as effortlessly, and therefore functionally, as they have the potential to do using the analysis of normal movement as your basis...

For group B, normal movement was also critical with more emphasis on facilitating normal movement through functional activities.

According to group A, the analysis of postural sets, developed since 1986, has provided the foundation for current practice by enabling the therapist to analyse normal movement, assess alignment of key points and the interaction of the patient’s base of support with gravity. Group B agreed that the analysis of how each key point moved in relation to another was important. Both groups agreed that there was no hierarchy of key points; all were equally important; and therefore therapists could work proximally to distally or distally to proximally:

…In the past you worked on your central key point all the time, so everybody was mobilizing the trunk to affect the patient’s ankle or hand and not doing anything else whereas nowadays you go in and mobilize anywhere…

Therapist C explained that terminology had changed, moving away from the emphasis on inhibition of tone using reflex inhibiting patterns, and onto the analysis of postural sets.

Both groups agreed that there was now much emphasis placed on having a well aligned musculoskeletal system (i.e. alignment of joints, muscles and key points), upon which to base rehabilitation of the CNS i.e. it was recognized that this might require a multi-therapist approach in order to facilitate normal movement in the patient. It was also agreed that the therapist aims to obtain an automatic firing of muscle activity, and that this tends to occur when alignment is improved.

You can’t change the neurology without changing the muscular form-function …

…Before, we always got the joints aligned, thinking the muscles would follow and now we are actually working on muscle alignment using specific inhibitory mobilization.

Control of tone

The concepts promoted within this theme were: normalization of tone, preparation (essential movement components) and associated reactions. Group A spent a lot of time discussing tone; for this group spasticity was a combination of disinhibition, plastic reorganisation and mechanical changes. Controlling tone was still viewed as the key to facilitating normal movement for all therapists; group A additionally highlighted the need for preparation by promoting essential components of normal movement such as alignment, weight transference etc. as well as patient functional activity. Therapists in group B were less worried about perfecting movement components, and did allow compensation if it enabled the patient to do more for himself. All therapists felt that in the past there had been an overemphasis on controlling tone; this was still recognized as important but nowadays was always combined with facilitating movement:

…The only way to get any sort of natural, free movement is if the tone is normalized…

…The best way of inhibiting abnormal tone is to actually facilitate more normal movement; you no longer spend a lot of time on reducing tone.

For group A and therapist C, controlling associated reactions was viewed as important. It was agreed that ARs’ demonstrated that the patient could not cope with that level of stimulus; such reactions were detrimental, impeding the patient’s function. One therapist defined three categories of associated reactions: (1) pathological responses such as extensor thrust, flexor withdrawal, or positive support; (2) mass patterns due to any effort involved in movement; and (3) distal increases in tone that occurred with low proximal tone. Both group A and therapist C felt it was important to identify the triggers producing associated reactions; ARs’ were not discussed at all by group B.

Facilitation of movement

The concepts promoted within this theme were: patient activity, facilitation on an automatic vs a volitional basis, use of afferent inputs, functional activity and goal setting.

For group A, facilitation of movement was recognized as not simply encouraging the patient to be active in perhaps an abnormal way, but rather was seen as enabling the patient to achieve the optimal pattern of movement. For example, it was better to walk patients than to leave them sitting in a chair, but in doing so the therapist needed her hands on the patient, and enough support using other therapists, furniture, orthotics etc. to get the appropriate alignment:

…In the past too much time had been spent on taking down tone and you never got to the stage of being active…

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The emphasis in earlier courses seemed to be on mobilization; the therapist actually told the patient don’t move with me, just lie there and let me move you…

All therapists agreed that the patient needed to be active to produce plastic changes within the CNS. For group A and therapist C, the key was to get the patient to be active through facilitating normal movement components on either an automatic or a volitional basis. The therapist decided with each patient whether to work on an automatic or a volitional basis. It was thought better to facilitate movement automatically, but cognitive guidance could be used when movement was not being facilitated, components were not available or the patient was learning a new movement:

I would try and treat patients on both an automatic and a volitional level and may be biased in which was used more, depending on the patient…

…Pure facilitation is where you take the patient and they move in response to your handling…you have to gradually get the same response with less facilitation, less handling, less cues so the patient is given back control of the movement. The more you can work a patient to an automatic level the better…

Group B agreed that it was preferable to facilitate movement on an automatic basis but that was not always possible. Everyone agreed that automatic and volitional movement were linked, the bias towards using automatic or cognitive control depended on the task at hand and the patient. Therapists often reported that they facilitated movement on a purely automatic basis through placing, which was defined as getting the patient to move in response to handling. It was thought that this type of facilitation gave the patient the background control to perform volitional movement. Carry over was achieved by the therapist gradually withdrawing ‘hands on’ and giving control back to the patient.

Group A identified the major proprioceptive inputs that were used with patients as: base of support, gravity and rotation. Verbal inputs were used as adjuncts to proprioception for reinforcement or for stopping unwanted activity. Visual input was also used as an adjunct to manual handling:

Verbal inputs are used a lot for reinforcement …often talk is used to stop unwanted activity…

Group B agreed that all afferent inputs (i.e. manual, visual and verbal) could be used to stimulate movement, but there was a definite emphasis on manual guidance by the therapist. It was recognized that while visual inputs sometimes led patients to overuse optical righting reactions, therapists might have to use vision with patients with neglect or ataxia. What the therapist actually used depended on the task and the patient, for example visual cues were important when reaching for objects or for patients with poor sensation; information could be fed through to patients through any channel. Tapping, vibration, icing etc. were viewed as more ‘unnatural’ inputs; it was felt that there were quicker, more natural ways of facilitating movement.

All groups agreed that therapists worked on facilitating specific components of movement in different positions, but it was felt that they must ultimately put these movement components together within functional goals such as walking, sitting to standing or reaching for an object. For these therapists, the patient needed to achieve a functional goal; that was the ultimate aim of treatment.

If your goal is getting from sitting to standing. There are times when you work on the movement components of the task; there are times when you work on the task…

…You might work on the functional task to get control or you might work on control to get function…

Walking was used as an example of function by everyone:

A few years ago you wouldn’t have walked anybody until they were ready, whereas now you would facilitate them while they are walking and trying to gain things as they are walking rather than holding off until the magic day when they get pelvic extension…

Group B stated that therapy was aimed at facilitating patterns of movement in normal everyday activities such as dressing, and/or washing dishes.

Goal setting

Group A identified goal orientation as important; there was a difference between the aims of therapy which might be focused on controlling tone and obtaining selective control, and the functional goals that are set with the team and the patient. It was felt that the role of the physiotherapist was to give the patient enough balance and movement to be able to achieve his/her
The Bobath concept

functional goals. Group B noted that the aims of therapy were usually identified in the problem list of the patient record; these aims referred to the movements that were required to achieve functional goals, set with the team and the patient:

...Things are going much more in the idea of patient focused goals. The focus is on what do the patients want to get out of rehabilitation...

...In the physio notes you write down what movements are actually needed to achieve the patient’s goals...

Motor learning

Group A elaborated on motor learning from a Bobath perspective stating that the patient was not learning a new way of doing something, instead the patient was re-accessing pathways at a lower level. In order to do this, movement needed to be learnt in a variety of positions to consolidate critical movement components. For this group, the Bobath concept gave the patient the opportunity to experience movement in many different ways. Repetition was important to consolidate motor control, but it did not mean moving in exactly the same way. For example, the components required for gait might be practised in standing or supine or prone standing; it was important to repeat the components of normal movement in many different positions and activities.

A broad concept

All groups agreed that the Bobath concept was very broad. Therapists could use orthotics, wedges or walking aids to obtain more normal movement. It was felt that using other techniques in parallel such as Maitland mobilizations was compatible with the Bobath concept.

Group B identified the experience of the therapist, the type of setting and collaboration with occupational therapists and carers as influential factors in the practice of stroke rehabilitation. Group B commented on how experience helped therapists in treatment planning. Working in the community made it easier to focus on function and the patient’s goals.

...You can look at the functional side of things much more easily at home because you have got their equipment, the things they use and the things they want to be able to do and the things they enjoy doing...

Group B also agreed that it was important for the patient to experience movement in many different ways. They felt that working with occupational therapists enabled physiotherapists to become involved in activities that made sense to the patient rather than just practising components of normal movement such as weight transference or pelvic tilt.

Theoretical assumptions and statements

Having spent the majority of the focus groups discussing how the Bobath concept had evolved since Bobath (1990), the participants were then asked for their views on the theoretical assumptions identified by Lennon (1996). All therapists agreed that recovery of function was based on neuroplasticity. Group A agreed that therapists used a systems model of motor control; in contrast group B therapists were not used to this terminology, but agreed that there were many different factors influencing rehabilitation. All therapists agreed that although neurophysiology was the primary deficit, behavioural and kinesiological factors also had an important bearing on treatment. Muscle and joint alignment as well as patient motivation and goal orientation were considered just as important as controlling tone and facilitating movement; all these factors were seen as interrelated.

The therapists were asked for their views on a series of statements that articulated key assumptions derived from published literature on the neurodevelopmental sequence, the direction of the recovery of movement, proximal versus distal control, translation of movement components into tasks, carryover outside therapy and the use of walking aids and orthotics. It was reported that the neurodevelopmental sequence was no longer adhered to. All therapists agreed that recovery of movement occurred both proximally and distally and this therefore needed to be facilitated both proximally and distally. Facilitating the components of normal movement could lead to an improvement in functional tasks, but not in every case; the functional tasks themselves also needed to be practised in treatment sessions. It was recognized that patients should be given advice on how to move outside therapy to achieve carryover, but this very much depended on what the patient was capable of doing and how they were doing it. The therapists did not like the use of the term ‘exercises’ or ‘practice’ in relation to home management. Both walking aids and orthotics were used to facilitate more normal movement and it was agreed that they should not
be viewed as a sense of failure on the part of the therapist.

Discussion

This study asked expert practitioners how the theoretical rationale behind the Bobath concept had changed since Bobath’s last publication on adult hemiplegia in 1990. Current findings highlighted that there had been a change in terminology with a shift away from ‘reflex inhibiting patterns’ and ‘abnormal synergies’, as therapists no longer used this language. Therapists now believed it was much more important to analyse the alignment and interaction between key points in order to determine the most appropriate treatment plan. Interestingly Edwards (1996), a former Bobath tutor, is the only author to have published this newer method of analysing the relationship between the central key point of the trunk with the other key points in different positions.

The contribution of musculoskeletal changes to abnormal tone was acknowledged. New techniques had developed to align muscles appropriately with joints during the practice of movement components and activities; these are referred to briefly in Lynch and Grisogono.

Within the Bobath concept, tone remains a major problem in the rehabilitation management of the hemiplegic patient. It was felt that in the past there had been an overemphasis on controlling tone; this was still important but now was always combined with facilitating movement. This is in agreement with Carr et al. (1995) who suggest that therapists should predominately treat patients to improve movement performance, not normalization of tone. This idea is confirmed in a recent textbook by two American Bobath tutors. The therapists in this study agreed that the movement patterns observed following stroke represented unmodulated movement patterns generated by the spinal cord. Abnormal tone and mass movement patterns were seen as a plastic response of the CNS, reinforced by the patient’s attempts to move. Thus spasticity and abnormal patterns could be the result of each individual finding the optimal strategy to perform functional tasks as proposed by Mathiowetz and Bass-Haughen (1994).

It was felt that within the Bobath concept preparation for function has a high priority; this might include mobilizing the trunk to facilitate pelvic tilt, or specific inhibitory mobilisation to the calf muscles to prepare the foot for weight bearing; this notwithstanding, it appears that goal directed activity is always introduced into each treatment session. This is in sharp contrast to Carr and Shepherd (1998) who focus on strength training and skill acquisition in actions critical to everyday life, with the therapist in the role of a coach rather than manually guiding the patients’ movements and activities. Both facilitation of normal movement components and task specific practice using specific manual guidance would appear to be critical elements of the Bobath concept.

Bobath therapists have been accused of impeding patients from becoming fully functional by over-emphasising quality of movement or normal movement. According to this study, this interpretation of the Bobath concept (at least as practised by these participants) is incorrect; for example walking, is facilitated at a very early stage. Indeed in order to facilitate early motor recovery, therapists were apparently quite happy to use both walking aids and orthotics in the task specific practice of walking at an early stage of rehabilitation.

Research in the field of motor learning has highlighted practice and feedback as two crucial issues for therapists. The type of practice used may depend on the task at hand; for example part practice of fast, discrete tasks or tasks with interdependent parts, is less effective than practising the whole task. It has also been suggested that patients need to rely on both intrinsic and extrinsic information to learn new skills. From the current study, it would appear that Bobath therapists strive to develop the patient’s internal reference system by limiting the use of visual and verbal feedback, and emphasising manual feedback at all stages of skill acquisition. Bobath therapists prefer to use manual guidance; however there is some evidence that this type of feedback to the patient may actually be detrimental to motor performance. With respect to skill acquisition, therapists in this study preferred to facilitate movement on an automatic basis, as opposed to the conscious use of verbal commands to produce volitional activity; however they did specify that this very much depended on the type of patient and the activity being carried out. All forms of afferent inputs (such as verbal instruction, demonstration, and visually guided movements) were acceptable, in addition to manually guided movements. This fits with Mulder et al.’s (1995) interpretation of skill acquisition, where the functional recovery of skills is reflected by: a decrease in cognitive regulation; a reduction in visual dependence and a restoration of sensorimotor adaptability.

According to motor learning theory, skill acquisition cannot be acquired during a single daily session with a therapist, therefore there needs to be more emphasis placed on practice outside therapy. All therapists discussed the importance of carryover; however therapists in group A were concerned about allowing...
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patients to practice activities without the guidance of the therapist. This issue remains open for debate and further investigation.

Goodgold Edwards (1993) and Carr and Shepherd (1998) have suggested that therapists should focus more on task specific training rather than the specific components of normal movement; all therapists in this study stressed the importance of practice of both the critical movement components as well as tasks. The issue of how much therapy time should be spent in facilitating normal movement components and how much time should be spent in task specific practice also needs to be addressed in further studies.

Conclusions

This study has demonstrated that the Bobath concept has changed since 1990. There was consensus among these experienced practitioners on the key concepts of current practice outlined in table 3. Therapists have taken on board newer concepts of a systems model of motor control; they pay just as much attention to the integrity of the musculoskeletal system as they do towards normalizing tone. They remain strong proponents of practising the essential components of movement such as symmetrical alignment, weight transfer or pelvic tilt, but acknowledge that these components also need to practised within functional tasks. There were some differences between the two groups of therapists: the ‘purist’ therapists focusing more on preparation and control of tone with the skilled, but less specialist group focusing more on function, team work to achieve carry over and patient oriented goals. The implications for future research are that this study is limited by the relatively small sample size (peer nominated experts); these findings are therefore not readily generalizable to all Bobath therapists working in stroke rehabilitation. For these reasons, information from this study has been used to devise a postal questionnaire targeting all senior physiotherapists working in stroke rehabilitation in the United Kingdom. This questionnaire will help determine if the ideas and concepts identified here are congruent with the majority of physiotherapists’ interpretation of the Bobath concept in stroke rehabilitation. There also appeared to be a difference in the way in which the Bobath concept was applied in different settings, this would also need to be investigated.

The main implications for practice are that the key assumptions identified such as the amount of time spent on preparation for activity versus task specific practice need to be evaluated in experimental studies. This study is in agreement with Ryerson and Levitt (1997: 84), who state that task oriented practice is generally unsuccessful if the patient lacks essential movement components. This aspect of treatment requires further investigation.

More outcome studies are required in neurological physiotherapy as a means of establishing which are the most effective treatment methods in promoting motor recovery in adult patients following stroke. Bobath therapists have developed very skilled handling techniques that modify the patient’s tone and enable patients to experience the sensation of more normal movement; however there is no experimental evidence as yet to suggest that this approach produces better recovery and functional outcomes than any other treatment approach.

Acknowledgements

I am very grateful to my clinical colleagues in Northern Ireland for agreeing to participate in this study. I would also like to thank my doctoral supervisor, Professor David Baxter, for his guidance in the write up of this study.

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