

Commentary on Oh H. and Seo W. (2003) Sensory stimulation programme to improve recovery in comatose patients. *Journal of Clinical Nursing* 12, 394–404

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The rational management of patients recovering from post-traumatic coma has been plagued by a paucity of hard data addressing the role of different physical interventions. In this paper, Oh and Seo present some useful and thorough research in a clinical area that is critically under-researched. As technology, knowledge and understanding advances, the number of patients surviving severe brain injury is increasing. Although the majority make a good recovery, a minority remain in coma, the minimally conscious state or the vegetative state. It has been estimated that as many as six to eight in 100 000 people each year sustain a moderate or severe head injury, with long-term consequences. Unfortunately, this is not reflected in the provision of health care or research effort

in this field. These patients are often ignored by modern health care. While billions of research pounds and dollars have been spent on the investigation of (mainly ineffective) acute neuroprotective interventions, little research effort has been directed at dealing with the clinical reality of patients who are left severely disabled following brain injury.

There should no longer be any doubt that early rehabilitation is essential to the effective care and long-term recovery of patients who have sustained a brain injury. As a result, the interface of clinical responsibility between acute care and rehabilitation has become increasingly blurred, with acute care teams taking greater responsibility for early rehabilitation (Von Wild, 2001). It is no longer appropriate to initiate rehabilitation only after acute care has come to an end, not only for self-evident logistic and clinical reasons, but also because the biology of acute inflammation following brain injury imperceptibly merges into processes involved in repair

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and recovery. Oh and Seo's paper is important because it demonstrates the potential benefit to patients when aggressive early rehabilitation, in this case sensory stimulation, is initiated. As the authors note, they present a small sample and further research is required to confirm the findings.

The multidisciplinary Cambridge Coma Study Group, of which the authors of this commentary are just a small number, is involved in research projects exploring recovery from coma and residual brain activity in patients diagnosed as being in the minimally conscious or vegetative states (Menon *et al.*, 1999; Owen *et al.*, 2002). Experience gained during this research would suggest that those patients being cared for in rehabilitation centres tend to demonstrate greater awareness than those in centres with minimal input.

Inconsistencies in the provision of intermediate and long-term care are also supported by qualitative data collected through interviews being conducted with the relatives of minimally conscious and vegetative patients. They repeatedly report seeing their family member cared for in inappropriate settings, including orthopaedic units and clinical facilities that care for the elderly, and underline the struggle to find appropriate long-term care with rehabilitation input. For many families this is the cause of considerable stress and anxiety, and leads to a near universal feeling that neither the patient nor their families get the support that they deserve.

While the data provided by Oh and Seo are timely and relevant, we believe that the Glasgow Coma Scale (GCS) is not the ideal assessment tool in this context. The GCS is one of the most widely used measures of level of consciousness and has been demonstrated to be useful and valid during both the early postinjury period and later during the early stages of recovery (Jennett, 2002). The GCS is particularly useful because it enables comparison between an early postinjury assessment and subsequently during recovery. However, in our experience, the GCS does not possess sufficient sensitivity to small changes during the recovery phase. As a result, small gains may go unnoticed and it is not unusual for clinicians and relatives to be misled into believing that no recovery is occurring, even when slow but subtle progress is continuing over many weeks or months (Shiel *et al.*, 2000). Failing to recognize such changes could suggest a falsely poor prognosis, and may affect the motivation and level of hope of family members and professional carers.

A tool that facilitates detailed assessment when recovering from coma is the Wessex Head Injury Matrix (WHIM). This 62-item hierarchical assessment of behaviour was developed following detailed observation of 88 severely head injured patients during their recovery from coma (Shiel *et al.*, 2000). The tool can be used by all members of the multidisciplinary team, with input from the patient's family.

The WHIM successfully bridges the gap between the GCS and standard tests of cognition, motor skills and dependency, which cannot be applied until the later stages of recovery. If Oh and Seo had used a more sensitive measure, such as the WHIM, they may have seen more immediate subtle changes in their subjects' behaviour. Our own research has demonstrated that changes in WHIM scores can occur before changes in GCS scores, possibly facilitating earlier detection of deterioration or improvement. Again, this requires further research.

Oh and Seo used a range of motion exercises for their sensory stimulation. In our experience, the clearest demonstration of arousal in coma and minimally conscious patients has been seen when standing them using electric standing frames or tilt tables. In addition to contributing to minimizing the risks associated with prolonged immobilization, standing patients creates the best position for environmental exploration (Quintieri & Serra, 2002) and sensory stimulation (Carr & Shepherd, 1998). It assists with distributing compression forces through bones and applies a stretch to soft tissue predisposed to developing contractures (Carr & Shepherd, 1998).

We have now assessed a number of patients before and after standing using the WHIM. Patients demonstrated significant improvement in arousal, cognition and motor response. The clearest response was seen in patients with acute or subacute post-traumatic coma, but we have also observed marginal benefits from such postural manipulation in one patient diagnosed as being in a vegetative state. Importantly, the increased level of arousal was demonstrated to last for some hours after treatment. This has important implications for rehabilitation strategies but also requires considerable further research.

Active rehabilitation should begin immediately after severe head injury and should involve all patients, and should possibly include patients in the acute phase who remain mechanically ventilated. However, this is still far from being routine practice, possibly as the result of concern that early intensive stimulation might increase the cerebral blood volume and, as a result, intracranial pressure. In some units there is a belief that patients have to be capable of active participation in order to benefit from a programme of rehabilitation. The work presented by Oh and Seo demonstrates the potential benefit that such an aggressive and early rehabilitation programme might have for the patient, their family, and potentially, the providers of health care. What the authors do not make clear is that early and aggressive rehabilitation requires a multidisciplinary collaboration at an unprecedented level. It is clear that there needs to be greater research emphasis on these groups of patients.

Contributions

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