Unawareness of Deficit in Acute Stroke: Neuropsychological Therapy Matters

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Motor deficiency is the leading cause of disability following stroke and the main target of neurorehabilitation. However, the co-occurrence of certain cognitive deficits, such as unawareness (lack of insight into one's stroke-induced symptoms) may impede rehabilitation and lead to poor functional outcome.[1] Such patients are unaware of their rehabilitation needs and thus fail to comply with and benefit from interventions. Unawareness following stroke varies in severity, may concern different functional domains, or be specific to a given deficit (i.e. patients may fail to acknowledge one symptom [paralysis], but recognise another [memory problems]). A prototypical form of unawareness is 'anosognosia for hemiplegia' (AHP); the apparent inability to understand or acknowledge contralesional paralysis. Patients may falsely claim that they moved their paralysed limbs in front of the examiner, despite blatant evidence to the contrary. Some patients even attempt to get out of bed or engage in other activities that are clearly hazardous.[2] AHP is commonly associated with right-hemisphere lesions, although its occurrence after left-hemisphere strokes should not be ignored.[3] AHP is reported to range from 33 to 58% of stroke victims, and persistent AHP may range from 10 to 17%.[2] Sometimes these patients make comments that suggest partial or tacit awareness into their deficits[4] and hence some clinicians or carers may believe that they are malingering or being 'difficult'. However, these patients typically have genuine (neurologically-induced) unawareness and may even falsely 'experience' their limbs moving.[5]

In practice, unawareness is a problem in acute and subacute rehabilitation. Although unawareness is often transient (lasting from days to months) its occurrence at the crucial acute stages can considerably impede rehabilitation.[6] Patients refuse treatments that improve prognosis, e.g. thrombolysis[7] and typically do not take appropriate safety measures.[8] Thus, unawareness is linked to a longer stay in hospital,[9] reduced likelihood of returning to independent living,[10] and lower scores on measures of functional recovery.[6] Furthermore, patients with impaired awareness are not amenable to traditional therapy, since they fail to appreciate the necessity for rehabilitation, nor are they realistic about their housing, social and financial needs after discharge. As such, the rehabilitation, reintegration and long-term care of unaware patients is labour-intensive and costly. In addition, about 30% of patients with AHP remain unaware beyond the subacute stage, with even more devastating effects in

their recovery.[11] Therefore, it is crucial that the acute rehabilitation of patients with unawareness targets cognitive *and* emotional problems, in parallel with physical problems.

Unfortunately, there is currently no accepted treatment for patients with motor unawareness, although clinical and experimental studies suggest that improvement and even dramatic recovery is possible.[12] For example, Fotopoulou et al.[13] reported the first technique to result in a permanent and total recovery of awareness in one AHP patient. They gave a patient with severe AHP visual feedback of her movements (or lack thereof) using a video, i.e. from a 3rd-person perspective (looking at one's body from the outside) and observed immediate recovery of awareness. Recent clinical and neuroimaging studies can explain this effect by suggesting that the neural mechanisms responsible for 1st- (embodied) and 3rd-person (disembodied) perspectives of one's body image differ.[14] Thus, in at least some unaware patients, brain regions responsible for the representation of the body from a 3rd-person perspective may be spared and may facilitate 1st-person awareness. Alternatively, the 'off-line' quality of the video replay may facilitate awareness because it allows patients to monitor their own body after they had attempted to perform an action.[5] Interestingly, this recovery was associated with an increase in depressive symptoms.[13] More generally, it has been shown that unawareness and related symptoms are both neurally[4] and subjectively[5] linked with important emotional processes. Thus, building a safe therapeutic rapport with the patient, avoiding direct confrontation when possible, and providing psychotherapeutic or pharmacological treatment against negative emotions may be important parallel considerations (see [15, 4]).

Unfortunately, existing research into unawareness syndromes is of limited appliance to clinical practice and rehabilitation, and remarkably, no systematic studies have been conducted to develop a treatment for stroke-induced unawareness. At least two important factors underlying this lack of research. First, this group of patients is usually disadvantaged by the fact that stroke rehabilitation research frequently excludes patients unable to comply with study procedures because of visuospatial (neglect) or cognitive (awareness) deficits arising from right-hemisphere stroke (see [16]). Second, although funding for research in the prevention, management and treatment of stroke can be obtained in the UK through several government funding schemes, (e.g. the MRC), funding for research on psychological therapy in stroke patients is much harder to obtain. Neuropsychology and neuropsychological rehabilitation fall in-between physical and mental health fields and thus also in-between the priorities of most funding bodies. For example, studies on neuropsychological rehabilitation are not medical enough for the MRC, and too medical for the ESRC. This disciplinary disadvantage is also reflected in the provision of psychological services in stroke survivors, despite clear guidelines on their importance (see [17] for discussion). Future research into neuropsychological therapy for unawareness is clearly warranted.

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