Published in : Annals of Neurology (2006), vol. 60, n°6, pp. 744–745
DOI: 10.1002/ana.20919
Status : Postprint (Author's version)

DOES THE FOUR SCORE CORRECTLY DIAGNOSE THE VEGETATIVE AND MINIMALLY CONSCIOUS STATES?

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Wijdicks and colleagues[1] recently presented the Full Outline of UnResponsiveness (FOUR) scale as an alternative to the Glasgow Coma Scale (GCS)[2] in the evaluation of consciousness in severely brain‐damaged patients. They studied 120 patients in an intensive care setting (mainly neuro‐intensive care) and claimed that "the FOUR score detects a locked‐in syndrome, as well as the presence of a vegetative state." [1] We fully agree that the FOUR is advantageous in identifying locked‐in patients given that it specifically tests for eye movements or blinking on command. This is welcomed given that misdiagnosis of the locked‐in syndrome has been shown to occur in more than half of the cases (see Laureys and colleagues[3] for review).

As for the diagnosis of the vegetative state, the scale explicitly tests for visual pursuit, and hence can disentangle the vegetative state from the minimally conscious state (MCS). The diagnostic criteria for MCS have been proposed[4] only recently, but Wijdicks and colleagues[1] do not mention the existence of this clinical entity in their article. As for the vegetative state, MCS can be encountered in the acute or subacute setting as a transitional state on the way to further recovery, or it can be a more chronic or even permanent condition. The MCS refers to patients showing inconsistent, albeit clearly discernible, minimal behavioral evidence of consciousness (eg, localization of noxious stimuli, eye fixation or tracking, reproducible movement to command, or nonfunctional verbalization).[4] The FOUR scale does not test for all of the behavioral criteria required to diagnose MCS.[4] It is known from the literature (see Majerus and colleagues[5] for review) that about a third of patients diagnosed with vegetative state are actually in MCS, and this misdiagnosis can lead to major clinical, therapeutic, and ethical consequences.

We tested the ability of the newly proposed FOUR scale to correctly diagnose the vegetative state in an acute (intensive care and neurology ward) and chronic (neurorehabilitation) setting. Patients were assessed using the GCS,[2] FOUR scale,[2] and Coma Recovery Scale‐Revised (CRS‐R)[6] in randomized order. The latter scale was specifically developed to differentiate vegetative patients from MCS and to identify patients that have emerged from MCS. The basic structure of the CRS‐R is similar to the GCS and the FOUR scale, but its subscales are much more detailed, targeting more subtle signs of recovery of consciousness. This increased attention to subtle but potentially important clinical signs lengthens the administration time of the CRS‐R and makes it more challenging to use in the intensive care setting.

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Sixty severely brain‐injured, postcomatose (ie, GCS ≤ 8) patients were prospectively studied (15 in New Jersey and 45 in Liège). Mean age was 50 years (range, 18–86 years); 39 patients were men. Cause was traumatic brain injury (24 patients), postanoxic-ischemic encephalopathy (14 patients), ischemic or hemorrhagic stroke (9 patients), aneurysmal subarachnoid hemorrhage (4 patients), metabolic encephalopathies (3 patients), status epilepticus (3 patients), encephalitis (2 patients), and craniotomy for brain tumor (1 patient). All patients were assessed free of sedative agents or neuromuscular function blockers, and 22 acute patients were intubated. Thirty patients were studied in the acute setting (ie, within 4 weeks after their brain insult; mean, 11 days; range, 1–24 days), and 30 patients were studied in a chronic setting (ie, more than 4 weeks after the insult; mean, 23 months; range, 1 month to 16 years).

Overall, 29 patients (16 acute and 13 chronic patients) were considered as being in a vegetative state based on the GCS (ie, GCS subscores showed spontaneous or stimulation‐induced eye opening [E > 1]; absence of verbalization [V < 3]; and absence of localization of pain [M < 5]). The FOUR scale identified 4 of these 29 patients (1/16 acute and 3/13 chronic patients) as not being vegetative given that these patients showed visual pursuit (FOUR scale subscore E = 4). This finding confirms the authors' claim that the FOUR scale is superior to the GCS in detecting a vegetative state "where the eyes can spontaneously open but do not track the examiner's finger."[1]

However, the CRS‐R identified an additional seven patients (four acute and three chronic) showing visual fixation (ie, eyes change from initial fixation point and refixate on a new target location for more than 2 seconds on at least two of four trials), and hence meeting the criteria for MCS set forth by the Aspen Workgroup.4 Therefore, of the 25 patients identified as being in a vegetative state by the FOUR scale, 7 were diagnosed as being in a MCS by the CRS‐R (4/15 acute and 3/10 chronic patients). All seven of these patients showed visual fixation, a clinical sign heralding recovery from the vegetative state,[4] but not included in the FOUR eye response score.

In conclusion, we welcome this new scale and its effort to more accurately and expeditiously diagnose the locked‐in syndrome by specifically assessing voluntary eye movements. The FOUR scale also adds assessment of eye tracking, which allows it to differentiate vegetative from MCS patients, but it should be noted that both acute and chronic patients may solely show visual fixation, an item not evaluated by the FOUR scale.

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