

## NEUROGENIC BOWEL DYSFUNCTION IN POST-COMATOSE PATIENTS

### Hypothesis / aims of study

A very large number of brain injured patients are affected by Neurogenic Bowel Dysfunction: among those surviving, 20–40% will have AI in the first months after the stroke and in 9–15% AI persists in the chronic phase. Medical literature offers only limited data regarding AI as a result of acquired brain injury (ABI), and the difficulty in determining its actual frequency lies in the potential concurrent effects on the gastrointestinal tract, such as pharmacological treatments, enteral feeding, motor difficulty in accessing services, and cognitive disorders (1). In every case the presence of AI can be a determining factor in extending the length of hospitalization in an intensive rehabilitation unit. The neurophysiology of the anorectal system and defecation supports the importance of voluntary voiding (primarily controlled frontally) at the right time and place. The appropriate stimulus to voiding originates in the right sensory perception afferent to the medulla, as well as to the encephalic centers via myelinated A $\delta$  fibers and non-myelinated C fibers. Studies have shown that at the cortical level both the cingulate gyrus and the pre-frontal cortex are afferently activated by the nerves radiating from the rectal ampulla and anal canal. Few studies (2, 3) exist regarding complications related to AI in association with brain injury, such condition being more often associated with—in late outcomes—cognitive and behavioral disorders than an organic pathology. The aim of this study was to determine the cumulative incidence of AI in a group of inpatients in a Neurorehabilitation facility and to assess its persistence after a 10 years follow up.

### Study design, materials and methods

Between november 1999 and december 2008, 242 patients suffering the sequelae of a severe brain injury (initial Glasgow Coma Scale [GCS]  $\leq$  8) were admitted consecutively to a Neurorehabilitation Unit. Of these, 76 (31%) presented a vegetative state, 88 (36%) a minimally conscious state and 78 (33%) a conscious state on admission. The only criterion precluding access to the Unit is mechanical ventilation. Patients with a tracheotomy tube or percutaneous endoscopy gastrostomy (PEG) tube are accepted and there are no time limits with respect to the acute event, although the earliest possible access is guaranteed.

There were 179 males (74%) and 63 females (26%), with a mean age of  $40.2 \pm 24.3$  years, admitted  $8.3 \pm 5.6$  weeks after ABI. The causes were as follows: traumatic brain injury ( $n = 148$ ), ischaemic or haemorrhagic stroke ( $n = 50$ ), post-anoxic-ischaemic encephalopathy ( $n = 32$ ), aneurysmal subarachnoid haemorrhage ( $n = 9$ ), and miscellaneous acute neurological conditions ( $n = 3$ ).

A detailed medical history was collected for all patients. A physical medicine examination and neurological examination were carried out every week and routine blood tests and, where necessary, radiological and neuroradiological investigations were carried out every month.

The Neurorehabilitation Unit programme for these patients includes the provision of optimal nutrition, control of infections, management of bladder, bowel and autonomic disorders, provision of specialist seating and control of posture and tone problems.

### Results

Of these 242 patients, 72.3% presented AI at admission. The standard assessment protocol for patients with acquired brain injury was followed for all patients at admission ( $t_0$ ) and at discharge ( $t_1$ ), and wherever possible there was an assessment protocol for anorectal dysfunction. For 124 of the patients it was also possible to carry out an assessment at the five-year follow-up stage ( $t_2$ ). The number of subjects who presented AI at time of discharge (88 patients, 43.3%) had decreased significantly by comparison to the initial assessment, as McNemar's test shows ( $p \leq 0.001$ ); the presence of frontal injury does not appear to distinguish one incontinent patient from the next; in fact, the percentages do not vary significantly ( $\chi^2 = 0.43$ ;  $p > 0.05$ ). Among those who recovered or maintained consciousness at discharge (65%), 21 complained of soiling. The two groups of patients with or without AI do, however, vary in LCF and DRS scores and on the duration of hospitalization: The Mann-Whitney U test and the  $t$  test for independent samples in fact show a significant gap, except in the NRS scores. A five-year follow-up for 124 patients revealed a clinical resolution for 45% of the AI patients and the reappearance of leakage with symptoms related to stress incontinence in four patients with significant weight gain.

### Interpretation of results

The sample group thus presented no apparent correlation between the presence of AI and the duration of the coma, the type of feeding, the possible presence of *Clostridium Difficile* (during the hospitalization stage) or the presence of related pelvic bone lesions. Even the presence of frontal injury did not appear to differentiate incontinent subjects, who were nevertheless hospitalized for longer rehabilitation periods.

### Concluding message

The persistence of AI episodes in brain injured patients does not appear to be exclusively correlated with a cognitive or behavioral deficit, but is possibly associated with weight gain.

### References

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Disclosures

**Funding:** NONE **Clinical Trial:** No **Subjects:** HUMAN **Ethics Committee:** ASL CUNEO ETHICS COMMITTEE **Helsinki:** Yes  
**Informed Consent:** Yes