Behavioral disorders after traumatic brain injury: Why a special issue in the *Annals of Physical and Rehabilitation Medicine*?

It is now more than 150 years ago that Harlow reported the surprising case of Phineas Gage, an American railroad worker who showed profound changes in personality and behavior after a large iron rod was driven completely through his head, penetrating his left frontal lobe [1] (Fig. 1). These changes were severe enough so that his friends said that he was “no longer Gage”.

Since that time, a large number of publications have shown that traumatic brain injury (TBI), whether due to focal penetrating injuries, as in Phineas Gage’s case, or to diffuse closed head injury due to acceleration/deceleration forces applied to the brain, produce behavioral changes in patients who survive the injury. Such troubles are a complex combination of lack of control (dissociation, impulsivity, aggressiveness) and lack of drive (apathy) associated with disordered higher-order cognitive functions involved in goal-directed behavior [2]. These changes, which are sometimes poorly acknowledged by the patients themselves, due to lack of awareness (anosognosia), may have devastating consequences in terms of family, social and vocational functioning. Behavioral and personality changes were repeatedly found significantly related to poor outcome and to increased family burden after severe TBI [3,4]. Despite a large amount of research in the area, these troubles remain difficult to understand, assess and treat, thereby representing a challenge for rehabilitation professionals [5].

In 2011, the French Society of Physical Medicine and Rehabilitation (SOFMER), under the control of the French authority of health, organized a consensus expert conference on behavioral disorders after TBI to provide clinicians with an up-to-date review on how to deal with such disorders. Subsequently, evidence-based good practice recommendations following the methodology defined by the French health authority were elaborated. The full text of the recommendations can be found on the SOFMER website (http://www.sofmer.com/).

This special issue of the *Annals of Physical and Rehabilitation Medicine* presents a summary of these recommendations and a few additional related articles.

In the first chapter, Drs. Mathe and Luaute, the two leading organizers of the conference, present the general methodology used to establish the evidence and guidelines. The three following articles address the clinical aspects of behavioral changes: description and classification (Stefan and Mathe), underlying cognitive mechanisms (Arnould et al.), and assessment scales (Prouet et al.). Four articles address therapeutic options, presenting both evidence-based reviews and expert recommendations of non-pharmacological treatments (Wiart et al.), pharmacological treatments (Plantier et al.), treatment of acute agitation crisis (Luaute et al.), and prevention and community support (Luaute et al.). The final article includes the comments of a US world-leading expert in the field of TBI, Dr. Harvey S. Levin, who kindly agreed to comment on the French guidelines.

Clinicians will find here an extended and up-to-date review of the literature, critically analyzed by experts on this topic. Results may seem somewhat disappointing, owing to a lack of well-designed randomized controlled therapeutic trials, thus leading to a relatively low level of evidence regarding treatment. Nevertheless, despite this limitation, the guidelines, mainly based on expert
consensus, provide a wide range of practical recommendations for evaluation and treatment, which will undoubtedly help clinicians who deal with behavioral disorders. Among the take-home messages, we should remember that beta-blockers and anti-epileptics with mood regulation effects yield the most compelling evidence and should be preferably used for chronic agitation or aggressive behaviors. As well, “using a pharmacological treatment should not be a unique or systematic response” and family and environmental supports are key factors in social reintegration.

For Phineas Gage, recent reappraisal of his life highlighted an impressive social recovery in the years following his injury (for instance, he worked again as a stagecoach driver along a 100-mile route in Chile), which emphasizes the importance of social environment in the evolution of disruptive behaviors [6].

Disclosure of interest

The authors have not supplied their declaration of competing interest.

References


Jacques Luaute
Service de médecine physique et de réadaptation, rééducation neurologique, hôpital Henry-Gabrielle, CHU de Lyon, 69230 Saint-Genis-Laval, France
Centre de recherche en neuroscience de Lyon (CRNL), équipe IMPACT, Inserm, U1028, CNRS, UMR5292, Lyon, France

Philippe Azouvi*
Service de médecine physique et de réadaptation, hôpital Raymond-Poincare, AP–HP, 104, boulevard Raymond-Poincaré, 92380 Garches, France
Université de Versailles-Saint-Quentin, EA 4047, HANDIRESP, Versailles-Saint-Quentin, France

*Corresponding author. Service de médecine physique et de réadaptation, hôpital Raymond-Poincare, AP–HP, 104, boulevard Raymond-Poincaré, 92380 Garches, France
E-mail address: philippe.azouvi@aphp.fr (P. Azouvi)