Negative impact of litigation procedures on patient outcomes four years after severe traumatic brain injury: results from the PariS-traumatic brain injury study

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Negative impact of litigation procedures on patient outcomes four years after severe traumatic brain injury: results from the PariS-traumatic brain injury study


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ABSTRACT

Purpose: To analyze the effect of litigation procedures on long-term outcomes in severe traumatic brain injury.

Materials and methods: Prospective observational follow-up of an inception cohort including 504 adults with severe traumatic brain injury recruited in 2005–2007 in the Parisian area, France, with initial, one- and four-year outcomes measures.

Results: Four years after the traumatic brain injury, 147 patients, out of 257 who survived the acute phase, were assessed. Among these patients, 53 patients declared being litigants and 78 nonlitigants (litigation status was unknown in 16 cases). Sociodemographic characteristics, type of injury and initial severity did not differ significantly between litigants and nonlitigants, except for Injury Severity Score (worse in litigants) and the proportion of road traffic accidents (higher in litigants). One- and four-year outcomes were significantly worse in litigants for autonomy, participation, psychiatric and cognitive function but not quality of life (measured with the Glasgow Outcome Scale-Extended, the working activity status, the Brain Injury Community Rehabilitation Outcome, the Hospital Anxiety and Depression scale, the Neurobehavioral Rating Scale-revised and the Quality of Life after Brain Injury, respectively). Multivariate analyses highlighted litigation procedure as an independent significant predictor of lower autonomy, participation and psychiatric function and tended to predict lower cognitive function, but not lower quality of life, after adjustment for pretrauma characteristics, injury Severity Score, road traffic accidents and work-related accident status.

Conclusions: Patients with severe traumatic brain injury have a worse prognosis when involved in a litigation procedure and require special attention in clinical practice.

IMPLICATIONS FOR REHABILITATION

- The influence of litigation procedure on health and social outcomes in severe traumatic brain injury is a major issue that entail numerous levels of complexities.
- A wide range of interactions and factors related to the prolonged process of litigation against a third party may influence recovery.
- Results from the PariS-Traumatic Brain Injury study suggest that patients with a severe Traumatic Brain Injury who are involved in a litigation procedure within French jurisdiction compensation scheme have a worse prognosis than patients who do not.
- Health professionals should be aware of the potential adverse effects of litigation procedures on recovery, and provide appropriate interventions and information to patients and families in such cases.

Introduction

Recovery after severe traumatic brain injury (TBI) is very heterogeneous [1]. It is thus essential to understand the factors that predict symptom chronicity, and poorer health and social outcomes [1,2]. Among these predictors, the relationship between litigation and long-term prognosis following TBI remains debated [3,4].

Litigation is defined as proceedings initiated between two opposing parties, including a series of activities before, during and after a lawsuit, to enforce the legal rights of the victim [5]. Claimants with TBI caused by a third party, most often hire a private attorney, who usually works with an expert physician. Both will estimate the date of stabilization of symptoms, appraise...
sequelae, evaluate a wide range of heads of damage suffered, and the cost of the disability to the patient. In order to determine the level of compensation for personal injury, the state and circumstances in which the victim would have been if the accident had not occurred are considered. Therefore, both in- and out-of-court settlements take several years and repeated independent medical evaluations to negotiate the compensable status of the victim. In France, the victim of an injury caused by a third party receives compensation in addition to, and separately from any public disability subsidies.

The impact of litigation on the prognosis for recovery following traumatic brain injury is a controversial issue. It has been shown that seeking compensation following trauma is not “bad for health”, [3] that is, a litigation procedure is not a major predictor of worse medical and social outcomes after a road traffic accident (RTA) [6]. However, the vast majority of studies on litigation conclude that litigants suffer from greater distress, poorer recovery and worse community reentry outcomes than nonlitigants [4]. Recent studies in the field of major orthopedic trauma after a RTA, such as the one from Littleton and coll [7], have indicated that involvement in a compensation claim is associated with poorer physical, mental and overall health outcomes. However, these studies focused on physical injuries and failed to address the particular context of brain injury and associated cognitive-behavioral disorders.

As far as TBI is concerned, studies on litigation have focused mainly on mild-to-moderate TBI, [8] showing that litigants had a higher incidence of depression, [9] used more health care [10] and took longer to return to work [11] compared with non-litigants. Only a few studies have addressed this issue in patients with severe TBI, and findings are inconsistent. A study in Scotland [12] found that litigants reported more symptoms than nonlitigants but did not differ in terms of cognitive function and return to work 12 months postinjury. Another study in Wales [13] found no difference between litigants and nonlitigants in terms of psychosocial outcomes and psychological morbidity ten years postinjury. Lastly, in Australia, [14] a small negative association was found between financial compensation and recovery of disability and physical and mental health in severe TBI, five years postinjury.

The influence of litigation on health outcomes in severe TBI has been little studied worldwide and remains unclear. In this study, we investigated the impact of litigation on TBI outcomes in the context of legal recourse against a responsible party. The aim was to compare outcomes in patients involved in a litigation procedure with those who were not, four years after a severe TBI and to discuss possible explanations for any relationship.

Materials and methods

Context of the Paris-TBI study: French jurisdiction compensation scheme

Four financial compensation categories can be roughly distinguished and simultaneously addressed in France: publicly funded disability compensation (regardless of the involvement in a litigation procedure), work-related injury compensation, private individual cover insurance compensation, and claimant’s compensation when a lawsuit is filed against a responsible identified party (which is the focus of the present study).

As opposed to various countries, [15] acute care, rehabilitation and support services for patients in France are not commonly paid by third-party insurers in the scheme of a fault-based traumatic injury but are rather provided by public hospital with related expenses covered by the state health department. Patients with TBI are eligible for a range of public medical and social benefits regardless of their involvement in a litigation procedure (LP), and presumably similarly in litigants and non-litigants, including hospital care, outpatient rehabilitation, regular loss of income payments since the injury (during three years maximum), home care support services.

Work-related injuries include working benefits from the public social security system plus possible provident fund in case of an employer’s foresight program devoted for work incapacity situations. Private individual cover insurances might in some cases offer financial compensation depending on the contract purchased by the client prior to the accident.

The victim of an injury caused by a responsible third party will be compensated in France separately and in addition to public disability subsidies (the latter being much smaller). Victims of a TBI generated by others are most frequently defended by both an attorney and an independent physician. Both experts will carry out regular interviews and examinations in order to assess when the victim has been stabilized and what the sequelae are. The French Dintilhac classification [16] is the most used abacus that will support the costing of the disability situation and of the home support and community reentry needs. The basic principle of compensation for personal injury is to consider the circumstances in which the victim would have been if the prejudicial accident had not occurred and to assess the various heads of damage suffered. In the Dintilhac classification, amount and lump subsidies cover a wide range of sectors included into three categories (pecuniary and non-pecuniary, temporary and permanent, damage to direct and indirect victims). Major heads cover pain and suffering sustained, loss of amenity, esthetic impairment, loss of sexual function, loss of the prospect of founding a family, assistance by a third party (including compensation of ricocheting victims and informal caregivers), expenses of accommodation and vehicle conversion, loss of opportunity including loss of education, whether at school, university or in training, loss of future occupational earning, occupational impact loss of career chances. These heads of damage are negotiated via out-of-court and court claims settlement processes, often several years post-injury and thanks to repeated medical expertise. Compensable status of litigants becomes in part reliant on private defendant lawyer skills: settlement values in the form of capital and monthly lump sum may be reduced on the basis of contributory negligence on the part of an injured party. Moreover, those unable to establish the responsibility of the opposing side in causation of the injury will not benefit from financial resources and rely on publicly funded services only. In the case the opposing party is in prison, insolvent or remains unidentified, the French Victim’s Agency (Commission d’Indemnisation des Victimes d’Infractions) [17] will be in charge of the litigation process and compensation.

Paris-TBI study protocol

The present study is part of a larger study called Paris-TBI which was undertaken in 2005 in Paris city and the surrounding Ile-de-France region (11.9 million inhabitants, 12,000 km²). The Paris-TBI is an ongoing inception population-based cohort of individuals with severe TBI, for which comprehensive pre-traumatic and early data were collected prospectively, and outcome assessments were performed at 1-year and 4-year postinjury. Individuals aged 15 or more who had sustained a severe TBI (initial Glasgow Coma Scale (GCS) score ≤8, in the absence of other causes of coma) were consecutively recruited at the site of the accident by mobile emergency services over a 22-month period and assessed in acute care. A total of 504 patients were included (76% men, mean age
trained neuropsychologist conducted the interview of the patient. In the litigation procedure, it was planned as a face-to-face interview. A objective evaluation of cognitive functions and involvement in a interviews. As the 4-year assessment was intended to cover a and executive functions and was conducted through telephone gants and non-litigants.

The one-year assessment addressed global outcome (Figure 1). The one-year assessment addressed global outcome and executive functions and was conducted through telephone interviews. As the 4-year assessment was intended to cover a broad range of impairments, activities and participation, including objective evaluation of cognitive functions and involvement in a litigation procedure, it was planned as a face-to-face interview. A trained neuropsychologist conducted the interview of the patient along with his/her primary caregiver which usually took place at patient’s home. No financial compensation was given to participants, except for reimbursements of travel expenses. The detailed methodology, one- and four-year follow-up results and potential biased effects related to lost to follow-up patients have been previously reported [2,18–24]. Lost to follow-up patients did not differ from included patients in term of disability and injury severity, but loss to follow-up was significantly associated with preinjury alcohol abuse and unemployment.

Socio-demographic data and pre-TBI health outcomes included age, gender, years of education, previous psychiatric disorders and previous alcohol and drug abuse. TBI severity and acute care data included: the cause of the accident (including the type of Road Traffic Accident when applicable); the Glasgow Coma Scale (GCS) score; the duration of coma (days) and the length of stay in the acute care unit (days); the Injury Severity Score (ISS) [25] which is an anatomical scoring system that screen for multiple injuries divided into six body regions (head, face, chest, abdomen, extremities including pelvis and external). In each of these body regions, the severity of the respective injury is assessed on a six-point ordinal scale called the Abbreviated Injury Scale (AIS) and the total ISS score is obtained from the three most severely injured regions that are squared and summed; the Glasgow Outcome Score (GOS [26] at acute care discharge) which allows standardized descriptions of the objective degree of recovery after a TBI based on five categories (death, persistent vegetative state, severe, moderate and good recovery).

Assessments at one and four years included the Glasgow Outcome Scale-Extended (GOS-E) [27], which covers seven main areas (consciousness, independence at home, independence outside the home, work, social and leisure activities, family and friends, return to normal life) and provides an ordinal classification of disability in eight categories, ranging from death to upper good recovery.

The four-year assessment included evaluation of impairments, activities and participation, including: cognitive impairments using the Neurobehavorial Rating Scale-revised (NRS-r), [28] a semistructured assessment of cognitive-behavioral disturbances resulting from acquired brain injury; mood impairments using the Hospital Anxiety and Depression scale (HAD), [29] which has two subscores for anxiety and depression (self-assessment); the assessment of participation in instrumental, social and productive activities using the Brain Injury Community Rehabilitation Outcome scale (BICRO) [30] which includes eight dimensions assessed by a proxy (Mobility, Self-Organization, Socializing, Parent/Siblings Contact, Partner/Child Contact, Productive Employment, Psychological, Personal Care) health-related quality of life using the Quality of Life after Brain Injury (QOLIBRI), [31] an instrument specifically developed for TBI and validated cross-culturally in large international all-severity TBI samples, which includes 37 items providing a profile of HRQoL in six domains (cognition, self, daily life and autonomy, social relationships, emotions and physical problems) together with an overall score. Finally, return to full- or part-time paid work was recorded.

Patients and their relatives were asked whether they were involved in a LP, that is, victim of an injury caused by an identified responsible party and involved in a lawsuit compensation claim related to this injury. When the litigation procedure was settled, patients were asked to report the final amount of capital (in euros) obtained from the opposing party. Patients were asked to report whether the injury was declared additionally and separately as a work-related injury as well.

**Statistical analysis**

Baseline, one- and four-year data were compared between litigants and nonlitigants. Student’s t-tests or Mann–Whitney U-tests were used for continuous variables, and chi-square test was used for categorical variables (α error set at 5%). In order to investigate whether LP was independently associated with four-year health and social outcomes, multivariable linear regressions, ordered logistic regression and logistic regression model were computed. The dependent variables for the linear models were the BICRO, the NRS-r, the HAD depression, the HAD anxiety, and the QOLIBRI; the categorical GOS-E variable and the binary “return to work” variable were used to run the ordered logistic regression and logit model, respectively. Similar independent variables selected on the basis of previously published studies in TBI [1,2,32,33] were entered into the seven models respectively:

![Flow chart of PariS-TBI cohort including four-year assessment of litigants and non-litigants.](Image)

![Flow chart of PariS-TBI cohort including four-year assessment of litigants and non-litigants.](Image)
Table 1. Characteristics of participants (n = 131).

<table>
<thead>
<tr>
<th>Variables count (%) or mean (SD; min–max) [95% confidence interval]</th>
<th>Litigation procedure (n = 53)</th>
<th>No litigation procedure (n = 78)</th>
<th>Pearson Chi² p value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sociodemographic data and preinjury characteristics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age at injury (years)</td>
<td>31.7 (12.9; 15–76) [28.1 35.3]</td>
<td>33.9 (15.5; 15–81) [30.4 37.4]</td>
<td>p = .4</td>
</tr>
<tr>
<td>Gender male</td>
<td>43 (81%)</td>
<td>63 (81%)</td>
<td>Chi² = 0.003 p = 0.96</td>
</tr>
<tr>
<td>Education (years)</td>
<td>11.7 (2.7; 6–19) [10.9 12.5]</td>
<td>11.95 (2.9; 6–19) [11.3 12.7]</td>
<td>p = .63</td>
</tr>
<tr>
<td>Alcohol and/or drug abuse (yes)</td>
<td>5 (9%)</td>
<td>15 (19%)</td>
<td>Chi² = 0.85 p = 0.36</td>
</tr>
<tr>
<td>Prior psychiatric disorder (yes)</td>
<td>4 (8%)</td>
<td>9 (12%)</td>
<td>Chi² = 0.56 p = 0.5</td>
</tr>
<tr>
<td><strong>Injury characteristics and acute care data</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Road traffic accident (yes)</td>
<td>47 (87%)</td>
<td>51 (65%)</td>
<td>p = 0.003</td>
</tr>
<tr>
<td>Work-related injury (yes)</td>
<td>12 (23%)</td>
<td>10 (13%)</td>
<td>p = 0.14</td>
</tr>
<tr>
<td>Initial GCS (max = 15)</td>
<td>5.6 (1.65; 3–8)</td>
<td>6.08 (1.69; 3–6)</td>
<td>p = 0.18</td>
</tr>
<tr>
<td>ISS (max = 75)</td>
<td>32.9 (11.9–54)</td>
<td>28.4 (11.9–66)</td>
<td>p = 0.02</td>
</tr>
<tr>
<td>Duration of coma (days)</td>
<td>115.5 (7.8; 1–32)</td>
<td>10.2 (8.1; 1–50)</td>
<td>p = 0.37</td>
</tr>
<tr>
<td>Length of stay in acute care unit (days)</td>
<td>29.8 (23.1; 2–119)</td>
<td>26.3 (22.4; 2–134)</td>
<td>p = 0.38</td>
</tr>
<tr>
<td>GOS at discharge from acute care (1 = death to 5 = low disability)</td>
<td>3.6 (0.78; 2–5)</td>
<td>3.8 (0.86; 2–5)</td>
<td>p = 0.25</td>
</tr>
<tr>
<td><strong>One-year outcome</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GOS-E (1 = death to 8 = upper good recovery)</td>
<td>4.54 (1.07; 3–7)</td>
<td>5.45 (1.37; 3–8)</td>
<td>p = 0.006</td>
</tr>
<tr>
<td><strong>Four-year outcomes</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GOS-E (1 = death to 8 = upper good recovery)</td>
<td>5 (1.4; 3–7)</td>
<td>5.7 (1.5; 3–8)</td>
<td>p = 0.005</td>
</tr>
<tr>
<td>BICRO (0 = normal to highly dependent = 195)</td>
<td>84 (32.4; 26–149)</td>
<td>69.9 (29.3; 22–138)</td>
<td>p = 0.03</td>
</tr>
<tr>
<td>NRS-r (29 = no to 116 = Severe impairment)</td>
<td>38.9 (7.4; 30–56)</td>
<td>35.7 (5.7; 29–52)</td>
<td>p = 0.03</td>
</tr>
<tr>
<td>HAD – subscale anxiety (0 = no to 21 = severe symptoms)</td>
<td>8.1 (4.6; 1–18)</td>
<td>6.4 (4.2; 0–18)</td>
<td>p = 0.048</td>
</tr>
<tr>
<td>HAD – subscale depression (0 = no to 21 = severe symptoms)</td>
<td>7.1 (5.3; 0–21)</td>
<td>3.9 (3.5; 0–16)</td>
<td>p = 0.001</td>
</tr>
<tr>
<td>HAD total score (0 = no to 42 = severe symptoms)</td>
<td>15.2 (8.7; 1–39)</td>
<td>10.3 (6.9; 0–30)</td>
<td>p = 0.003</td>
</tr>
<tr>
<td>Return to work (yes)</td>
<td>13 (25%)</td>
<td>32 (41%)</td>
<td>p = 0.045</td>
</tr>
<tr>
<td>QOLIBRI (37 = bad to 185 = very good QoL)</td>
<td>67.3 (15.3; 36.8–97.3)</td>
<td>73.5 (17; 36.8–99.5)</td>
<td>p = 0.1</td>
</tr>
</tbody>
</table>

BICRO: Brain Injury Community Rehabilitation Outcome; GCS: Glasgow Coma Scale; GOS: Glasgow Outcome Scale; GOS-E: Glasgow Outcome Scale-Extended; HAD: Hospital Anxiety and Depression scale; ISS: Injury Severity Score; NRS-r: Neurobehavioral Rating Scale-revised; SD: Standard Deviation; QOLIBRI: Quality of Life after Brain Injury.

Ethical concerns

In accordance with French legislation, patients and their relatives were informed about the initial inclusion in the database, and informed consent of participants or their legal representatives was obtained before each assessment. Approval from Commissions that enforce research database legislation in France were obtained at each stage of the study, and approval from the local Ethical Committee (Comité de Protection des Personnes, CPP XI) was obtained before each assessment. The study was registered in ClinicalTrials.gov in August 2011 (identifier: NCT01437683).

Results

At the four-year follow-up, 53 patients declared being involved in a LP, and 78 declared not being involved in a LP and for 16 cases the status was unknown (Figure 1). Causes of injury in the nonlitigant group were road traffic accident (RTA) for 51 patients (65%), accidental falls for 25 (32%), suicide attempt for two. Causes of injury in the litigant group were RTA for 47 patients (87%), falls for three and aggression for three. Among those in the litigant group whose cause of injury was RTA, 17 patients (36%) were passengers or drivers in a car, 14 (30%) were motorcyclists, 12 (26.5%) were pedestrians, and four (8.5%) were cyclists. A total of 22 patients had also declared the injury as a work-related injury that had taken place either while commuting to work or during work time. Twenty-three patients reported that the LP was over four years after the accident and agreed to report the compensable claim capital as settled by the court. The mean overall amount reported was €210 152 (SD = 417 382) with a wide range from €1500 to €2 000 000.

As shown in Table 1, there were no differences between groups (LP/no LP) in terms of socio-demographic data and pre-TBI health outcomes, injury severity and acute care data, except for the proportions of RTAs and ISS scores, which were higher in the LP group. In contrast, one- and four-year GOS-E scores differed significantly between groups (and were strongly correlated to the initial severity of the TBI) were also forced into the model. Statistical analyses were performed using STATAv12.1 (Copyright 1985-2011 StataCorp LP Coll. Station, TX).

Discussion

This study, which was part of the larger París-TBI study, provides new insights into the complex and debated issue of litigation as a
Table 2. Multivariate regression models for outcome measures at four years postinjury.

<table>
<thead>
<tr>
<th>Table 2.</th>
<th>Multivariate regression models for outcome measures at four years postinjury.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>Ordered logistic regression</td>
</tr>
<tr>
<td>GOS-E</td>
<td>OR [95% CI]</td>
</tr>
<tr>
<td>BICRO</td>
<td>0.004</td>
</tr>
<tr>
<td>NRS-r</td>
<td>1.1</td>
</tr>
<tr>
<td>HAD-subscale depression</td>
<td>0.08 [0.53]</td>
</tr>
<tr>
<td>HAD-subscale anxiety</td>
<td>0.2</td>
</tr>
<tr>
<td>QOLIBRI</td>
<td>0.66</td>
</tr>
<tr>
<td>Return to work</td>
<td>0.53</td>
</tr>
</tbody>
</table>

Independent variables

| Gender (male) | 2 [0.84] | 0.36 | 3.7 [5.8 to 6.6] | 0.66 |
| RTA (yes) | 1.5 [0.61] | 0.36 | 2.5 [4.2] | 0.99 |

a For continuous variables.
b For dichotomic variables. Results show estimates of unstandardized beta coefficients for the linear full regression models and of log odds for the ordered logistic regression and logit model.

The results showed that patients involved in a LP had less autonomy in daily life, less social participation and employment, greater impairment of mood and a tendency to worse cognitive function compared with non-litigants; however, health-related quality of life was similar between groups. As shown in previous studies, the results confirmed that being young and male [7] and having a high level of education [14] were independently associated with a better prognosis at four-years in severe TBI. After adjusting for initial severity (ISS) and proportion of RTAs (which were higher in the LP group than the no-LP group), as well as for work-related procedures (possible confounding factor previously shown to interact with outcomes in litigants) [34], the negative effect of LP persisted in the multivariate analyses for most four-year outcomes. This result extends the findings of a recent study of patients with severe TBI, [14] which found a small negative association between involvement in a LP and disability and health status (using the Disability Rating Scale and Short-Form 36), five-year postinjury, by including investigation of limitation of activity and restriction of participation using GOS-E and BICRO scores. The present study not only demonstrated worse outcomes for self-reported symptoms (such as depression and anxiety), but also for objective indicators such as level of independence at home, social participation and return to work. Differences with the results of the few previous studies could be related to differences in the composition of the cohorts or country-specific legal procedures. The timing of the measurements also differed (within the first year [12,13] and 10-year postinjury [13]). If the results of the present study and those of these three core studies are not considered as contradictory but rather complementary, pooled results could suggest a “peak of the negative influence” of the LP on health and social outcomes four to five years postinjury, but with no long-term “scarring effect” as suggested by [13]. However, the hypothesis of patients being “cured by the verdict” [35] needs to be further evaluated within the long-term follow-up of the Paris-TBI study as well as other studies.

It is challenging to suggest explanations as to why the context of “blame” intrinsic to LPs impairs outcomes and recovery over a four-year period after a severe TBI. The literature highlights that there is not one single factor, but rather a spectrum of multidimensional factors, which account for the negative association between LP and prognosis following any type of injury [36,37].

Although controversial, the desire for a better financial situation [38] has been shown to contribute to poorer health outcomes in litigants [39–41]. It was historically reported by Dr Miller that the “patient’s condition is not the result of the accident but is related to the desire for compensation and the hope of financial gain” and that “all attempts of therapy at this stage are doomed to failure” [42]. Miller’s “accident neurosis” was later discussed under the term “compensation neurosis”, [43] and included in the International Classification of Diseases (ICD-9 and ICD-10) [44]. More recently, “cognitiform conditions” and “malingering” [45] have been reported in patients who exaggerated and feigned a variety of cognitive deficits to maximize financial compensation. Consequently, specific assessment tools for the medico-legal examination have been developed to reveal such behavior [46]. Such LP-induced behavior, in which cognitive dysfunction and functional limitation are exaggerated, have predominantly been described in mild-to-moderate TBI [8,42].

The iatrogenic effect of the litigation process per se might be another plausible explanation. More patients in the LP group showed activity limitation (fewer were independent and fewer were employed) and restriction of participation (lower levels of negative prognostic factor for health and social outcomes following severe TBI. 
participation in society and community re-entry) compared with the no-LP group. This might suggest that a LP might hamper the recovery and well-being of the individual, acting as a barrier in the sense of the International Classification of Functioning, Disability and Health defined by the World Health Organization. The stressful nature of the LP, [47] which induces flashbacks of the accident might make it difficult to move on until the process is over [48]. Years of litigation procedure with an unsettled situation might trap the patient into the unhealthy position of “the victim”, thus paralyzing life projects. Extreme dislike of medico-legal assessments and negative direct interactions with legal representatives and insurers from the opposing party might affect the recovery of vulnerable persons [37,48]. Aside from post-traumatic stress disorder, additional psychological distress related to the accident (such as anger, blame, a sense of injustice and entitlement) might be probably underestimated and might account for depression as reported in whiplash [39]. This also aligns with prior results of the Paris-TBI study [19] that showed that LP was an independent significant predictor of higher subjective burden in informal caregivers (as measured by the Zarit Burden Inventory), who therefore become indirect ricocheting victims.

Finally, involvement in a LP might reduce accessibility to usual health care and normal rehabilitation because of a parallel set of multidomain and regular examinations (including assessment from expert physicians, neuropsychologists, occupational and speech therapists). These separated assessments might generate confusion in patients between rehabilitation interventions and legal procedure that do not have the same purpose. A recent qualitative analysis reported that patients with TBI received less specialist care and support and had less choice over rehabilitation and care needs when they were involved in LPs [15]. Involvement in both the entirely separated legal and health systems might lead to misunderstandings through contradictory advice. In the LP process, patients and their families become embedded within a legal framework in which incapacity plays a key role, disconnecting them from their current rehabilitation and vocational needs. The fact that LP did not influence self-reported quality of life is an interesting finding as well. The paradoxical nature of the LP, that LP did not influence self-reported quality of life is an interesting finding as well. The paradoxical nature of the LP, [48] which induces flashbacks of the accident might make it difficult to move on until the process is over [48]. While the purpose of a LP is to secure future finances by maximizing the lifetime costs of injury, the present study might suggest that it might be an iatrogenic comorbidity in severe TBI. Health professionals should be aware of the potential adverse effects of LPs on recovery and provide appropriate psychological interventions and information to patients and families in such cases [7]. In the future, the issue of written guidelines for the provision of appropriate support for litigants and their families could be addressed.

**Disclosure statement**

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this article.

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