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Original article

Indicators of long-term return to work after severe traumatic brain injury: A cohort study

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ABSTRACT

Background: Return to work (RTW) is a major objective in the rehabilitation of individuals with severe traumatic brain injury (TBI). Implications for long-term occupational integration (beyond 5 years) have rarely been studied.
Objective: The objective was to assess long-term RTW and the associated factors after severe TBI.
Material and methods: Retrospective analysis of a cohort of individuals 16 to 60 years old admitted to hospital after severe TBI from 2005 to 2009 and followed prospectively. Medical and occupational data were collected from medical files and by systematic telephone interview to assess outcome at a minimum of 6 years post-trauma. Factors associated with RTW were investigated by multivariable regression analysis, estimating prevalence ratios (PRs) and 95% confidence intervals (CIs). A proportional hazards model was used to study RTW delay, estimating hazard ratios (HRs).
Results: Among the 91 individuals included (mean [SD] age 28.5 [11.3] years; 79% male), 63.7% returned to work after a mean of about 20 months, and 57.1% were still working at the time of the survey. Factors significantly associated with RTW on multivariable analysis were higher educational level (adjusted PR, 1.53; 95% CI, 1.15 to 2.03), absence of motor disability (adjusted PR, 1.82; 1.12 to 2.95) and behavioural disorder (adjusted PR, 1.26; 1.01 to 1.60), as well as disabled worker status (adjusted PR, 1.26; 1.01 to 1.60) (likelihood of the multivariate analysis model 53.1). Delayed RTW was associated with health insurance payments (adjusted HR, 0.40; 95% CI, 0.22 to 0.71), motor disability (adjusted HR, 0.34; 0.15 to 0.76), low educational level (adjusted HR, 2.20; 1.06 to 4.56) and moderate disability on the Extended Glasgow Outcome Scale (adjusted HR, 0.49; 0.27 to 0.91) (likelihood of the multivariate analysis model 335.5).
Conclusion: Individuals with the most severe TBI are able to RTW and remain in work. This study highlights the multiple determinants involved in RTW and the role of socioenvironmental factors.

1. Introduction

Return to work (RTW) is a major end-point for rehabilitation of individuals with severe traumatic brain injury (TBI), as is the case for many chronic pathologies affecting adults [1–4]. Apart from the strictly financial aspect, it is a personal challenge frequently evoked by patients and their families, because reintegrating working life plays an essential part in physical, psychological, and social well-being [5–7] that improves quality of life [8–11]. It is also a public health challenge, given the medical and social costs of health care and productivity loss due to prolonged time off work [12,13].

In the developed world, severe TBI is the primary cause of death and acquired disability in young adults [14]. It usually involves multiple trauma and has a severe impact on work ability. Trauma lesions give rise to various sequelae, including physical but also neurocognitive, behavioural and psycho-affective disorders, which constitute an "invisible disability". In France, 8500 of the estimated

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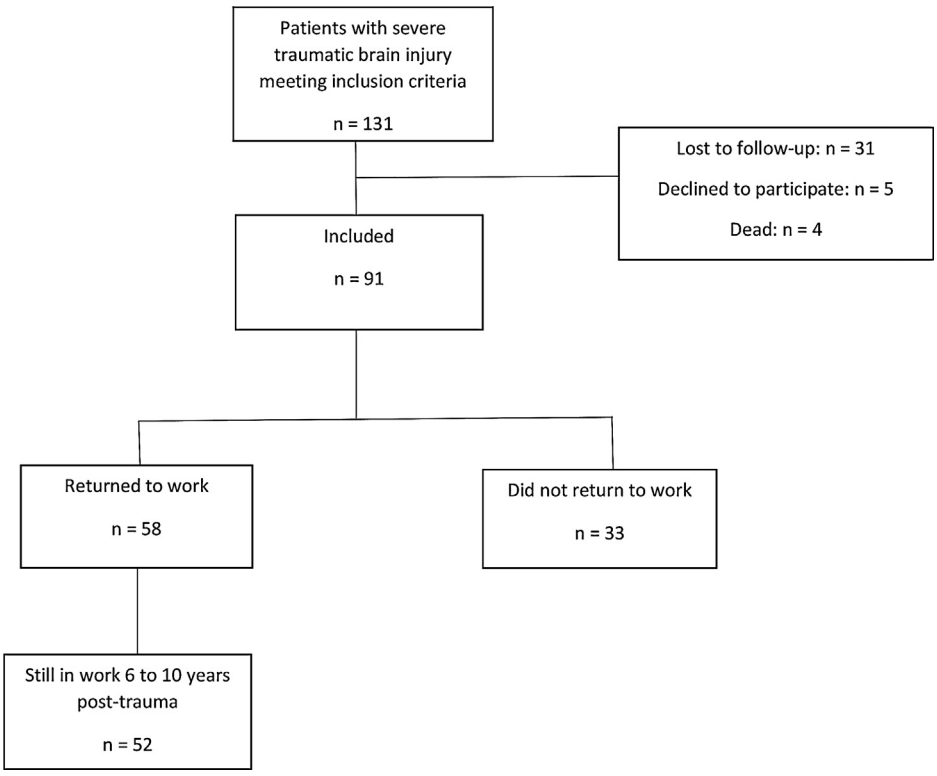

Fig. 1. Occupational outcome flowchart for individuals with severe traumatic brain injury.

150,000 to 180,000 annual victims of TBI show disabling sequelae and major difficulties in returning to work [15,16]. Many studies published in recent decades have focused on the RTW after TBI [17–21] and reported that rates of return varied greatly depending on the trauma severity and trauma-to-assessment interval: from 18% within 6 months [22] to 30% to 55% by 2 to 10 years after severe TBI [23–26]. However, the focus in the literature has mainly been on occupational status during the first 5 years post-trauma; RTW and job stability over the long-term have rarely been studied in this particular population [20,21].

The main purpose of the present study was to assess the frequency and conditions of and time taken to RTW. Secondary objectives were to determine factors associated with long-term RTW after severe TBI (6–10 years post-trauma).

2. Methods

2.1. Search strategy and inclusion criteria

The study included individuals with TBI admitted to the Henry Gabrielle Hospital, a university hospital specialised in neurological rehabilitation for adults (acquired brain injury and spinal cord injury). According to French law at the time of the study, approval from an ethics committee was not required. However, participants were informed of the use of their clinical data for research and could refuse this use.

Among individuals admitted between January 1, 2005 and December 31, 2009, a single-centre retrospective cohort was identified by using the medical information database of the Lyon teaching hospitals (*Hospices Civils de Lyon*). Patients were included if they were admitted to the rehabilitation department with a main diagnosis of severe TBI defined by a Glasgow Coma Scale (GCS) score ≤ 8 within 24 hr of trauma and/or with severe objective lesions (fracture or intracranial lesion) on brain imaging and if they were 16 to 60 years old at the time of injury (age compatible with employment). Exclusion criteria were presence of any individual history of pre-trauma congenital or acquired neurocognitive disorder and any known pre-trauma psychiatric disorder. A total of 131 individuals were identified as eligible (Fig. 1); 31 were lost to follow-up (change of residence or telephone number), 5 declined to participate (disability too severe, ongoing litigation, dispute with the hospital), and 4 died of an intercurrent disease. Thus, 91 individuals were included. Individuals in a persistent vegetative state ($n = 3$) were excluded.

2.2. Study implementation

Baseline and outcome medical and socio-occupational data were collected from 2 sources: medical files and semi-directive telephone interview with use of a standardised questionnaire with the participant if possible, or otherwise a close relative (parent, partner), and if this was not possible, the general practitioner. Telephone interviews were conducted between April 2014 and December 2015, so outcome was assessed 6 to 10 years post-trauma.

Data collection included pre- and post-trauma variables: sociodemographic status, pre-trauma occupational status, accidentology data, lesion severity, post-traumatic sequelae (presence/absence and type: motor and cognitive disabilities, depression, and behavioural disorders), occupational outcome, payments made by the national health insurance system[1], help with RTW, and help with job adaptation (see Supplementary Table 1). Each occupation was coded according to the occupational classification (*professions et catégories socioprofessionnelles*, PCS, 2013) established by the

[1] The French *Sécurité Sociale* national health insurance system comprises a number of different mandatory schemes (general, self-employed, agricultural, and special). It covers a certain percentage of healthcare charges and prescriptions and also makes direct compensation payments.

French office for national statistics (Institut national de la statistique et des études économiques, INSEE).

RTW after sick leave is complex and multidimensional, involving the individual, pathology, occupational environment, and socioeconomic context, and can be approached via several different concepts and definitions [27,28]. For the purpose of the study, RTW outcome was defined as "being employed at follow-up (6–10 years post-trauma) with resumption of paid work in a normal or sheltered setting at a minimum of 6 years post-trauma. Thus, the "RTW" group could include individuals who returned to work before 6 years and who were still at work during follow-up. Returning to education was also considered, as in previous studies [12]. Job stability was defined as returning to work to the same or similar job without work adaptation (e.g., disabled worker status or sheltered workshop).

2.3. Statistical analysis

Descriptive analysis involved using SAS v9.3 (SAS Inst., Cary, NC, USA). Categorical data were analysed by chi-square or Fisher exact test. Quantitative data were analysed by non-parametric Wilcoxon test (for 2 groups) or Kruskal–Wallis test (for more than 2 groups). Prevalence ratios (PRs) for the association of RTW with potential explanatory variables were estimated by log-binomial regression. Hazard ratios (HRs) measuring the association between time to RTW for those who resumed work and potential explanatory variables were estimated by a semi-parametric Cox survival model. The modelling strategy was similar for both analyses: the first step analysed associations with the variable of interest by univariate analysis (list of variables in Supplementary Table 1); then explanatory variables with $P \leq 0.10$ on univariate analysis were included in a descending procedure in multivariable analysis. The analysis estimated 95% confidence intervals (CIs). $P < 0.05$ was considered statistically significant. Multivariable modelling for both analyses converged. We used maximum likelihood methods rather than ordinary least squared methods to obtain estimates. Thus, we did not (and could not) report the adjusted R^2 statistic as it is usually thought of.

3. Results

3.1. Study population

Characteristics of the 91 participants are presented in Table 1. The cause of the TBI was mainly road traffic accidents ($n = 62$, 68.1%) and in 34 cases (37.4%), another party was responsible. Mean Glasgow Coma Scale score for initial severity was 5.6 (range, 4–7); mean coma duration was 16.2 days (range, 24 hr to 81 days).

Beyond 6 years of follow-up, most severe TBI victims showed cognitive disability ($n = 60$, 65.9%), behavioural disorder ($n = 52$, 57.1%), and motor disability ($n = 33$, 36.3%); 15 individuals (16.5%) were under treatment for depressive disorder and 14 (15.4%) for posttraumatic epilepsy. On the Extended Glasgow Outcome Scale (GOSE), 38 participants (41.8%) were classified as having "good recovery", 29 (31.9%) "moderate disability" and 24 (26.4%) "severe disability".

3.2. Occupational outcome

3.2.1. Frequency of and time taken to RTW

A total of 58 participants (63.7%) returned to work at a mean of 21.1 months post-trauma. Many (44/58, 75.9%) returned to their previous occupation. At a minimum of 6 years post-trauma, most ($n = 39$, 88.6%) were still working and 5 were not. At 6 to 10 years post-trauma, 50 individuals (57.1%) remained working or were at school. For participants who did not RTW ($n = 33$), the main reason for not applying for disabled worker status was that disability severity precluded any employment ($n = 20$ having "severe disability" on the GOSE).

Table 1
General characteristics of the population ($n = 91$).

Age, years, mean (SD)	28.5 (11.3)
<25	48 (52.7)
25–40	27 (29.7)
>40	16 (17.6)
Sex (male)	72 (79.1)
Marital status	
Single, divorced	51 (56.0)
Couple, married	40 (44.0)
Educational level	
No school-leaving certificate	41 (45.0)
School-leaving certificate (*baccalauréat*)	23 (25.3)
Higher	27 (29.7)
Occupational status	
Permanent contract, self-employed	51 (56.0)
Short-term, temporary contract	10 (10.0)
Sick-leave	1 (1.1)
Unemployed	5 (5.5)
Student	24 (26.4)
Seniority (years), mean (SD)	7.4 (8.2)
Socio-occupational category (PCS 2003 classification, INSEE)	
Artisan, shopkeeper, company director	5 (5.5)
Executive, higher intellectual profession	7 (7.7)
Intermediate profession	11 (12.1)
White-collar	11 (12.1)
Manual worker	28 (30.8)
Cause of accident	
Road traffic accident	62 (68.1)
Fall	17 (18.7)
Leisure accidents, aggression	12 (13.2)
Work-related accident	22 (24.2)
Third party responsibility	34 (37.4)
MAIS	
3	12 (13.2)
4	55 (60.4)
5	24 (26.4)
MFCI	
1	64 (70.3)
2	12 (13.2)
≥3	15 (16.5)
Baseline GOSE score, mean (SD)	5.6 (1.8)
3–4	30 (33.0)
5–8	61 (67.0)
Coma duration (days), mean (SD)	16.2 (14.9)
<21	66 (72.5)
≥21	25 (27.5)

Data are *n* (%) unless indicated. MAIS: Maximum Abbreviated Injury Scale; MFCI: Maximum Functional Capacity Index; PCS 2003, INSEE, 2003 Occupational and socio-occupational categories, French office for national statistics; GOSE: Extended Glasgow Outcome Scale.

3.3. Conditions of RTW

At a minimum of 6 years post-trauma, the working conditions were adapted for 33/58 (56.9%) of participants; among these, 30 (51.7%) initially returned directly to full-time work, and 28 (48.3%) to part-time work, including 38.6% ($n = 21/58$) to therapeutic part-time work for a mean 16.6 months. In addition, 37 (71.8%) participants had a permanent work contract or were self-employed, 7 (15.4%) had short-term work contracts, 5 (10.3%) were in temporary work, and 1 (2.5%) was in education.

For 14/58 (24.1%) participants, the job had changed or had been downgraded. Among the remaining 14 (24.1%) who had resumed work in another job, all received working conditions adaptation; 6 (42.8%) were in full-time work and 8 (57.1%) part-time work, including 4 (28.6%) in therapeutic part-time work. This therapeutic part-time work lasted a mean of 33.8 months. At a minimum of

6 years post-trauma, 13 of these 14 individuals (92.9%) were working: 8 (61.5%) with permanent work contracts or self-employed, 2 (15.4%) with short-term work contracts, 1 (7.7%) in temporary work, and 2 (15.4%) in sheltered work; 1 had lost his job.

Among the 58 participants who returned to work, 25 (43.1%) received payments from the national health insurance scheme: 16 (64%) received disability benefits and 8 (36%) compensation (lump-sum or regular payments) for a work-related accident. A total of 38 (65.5%) participants received help for RTW, and 43 (74.1%) received help to adapt the working conditions: 28/58 (48.3%) had disabled worker status, 33 (56.9%) had working conditions adaptation and 5 (8.6%) worked for a time in a sheltered workshop.

Among the 33 (36.3%) participants who did not resume paid employment or education, 21 (64%) claimed to be unable to work, 6 (18%) had no occupational project, 4 (12%) remained on sick leave until retirement, and 2 (6%) were undergoing retraining by an occupational guidance organisation. A total of 11 (33%) were receiving disability benefits or compensation for a work-related accident.

3.3.1. Factors associated with RTW

Variables significantly associated with RTW on univariate analysis were stable pre-trauma occupational status (permanent work contract), higher educational level, coma duration < 21 days, absence of motor and/or cognitive disability, absence of behavioural or depressive disorder, good GOSE score (“good recovery” category), change from “single/divorced” to “in couple/married”, no national health insurance payments and help in adapting working conditions, notably by classification as a disabled worker (Table 2).

The likelihood of the multivariate analysis model was 53.1. Factors independently associated with RTW were higher educational level, absence of motor disability, absence of behavioural disorder, and disabled worker status (Table 2). We performed correlation calculations between these 4 variables in the multivariate model and found no correlation > 0.8, which indicates no collinearity among these 4 variables. We also assessed the impact of initial GCS score (scores 5 to 9 vs 3 to 4) as a risk factor for RTW; the initial GCS score was associated with RTW (Supplementary Table 2).

Table 2
Factors associated with return to work on univariate and multivariable analysis.

	Univariate analysis		Multivariate analysis			
	Return to work ($n = 91$)					
	No ($n = 33$) n (%)	Yes ($n = 58$) n (%)	PR	[95% CI]	Adjusted PR	[95% CI]
Occupational status						
Permanent contract	13 (39.4)	33 (56.9)	1	–		
Short-term, temporary contract, sick-leave, unemployed	11 (33.3)	5 (8.6)	0.44	0.21–0.92		
Self-employed	4 (12.1)	1 (1.7)	1.10	0.84–1.45		
Student	5 (15.2)	19 (32.8)	0.28	0.05–1.62		
Educational level						
Higher	6 (18.2)	21 (36.2)	0.99	0.74–1.33	1.53	1.15–2.03
School-leaving certificate (*Baccalauréat*)	5 (15.1)	18 (31.0)	1	–	1.11	0.49–1.57
No school-leaving certificate	22 (66.7)	19 (32.8)	0.59	0.40–0.88	1	–
Coma duration (days)						
< 21	18 (54.5)	48 (82.8)	1	–		
≥ 21	15 (45.5)	10 (17.2)	0.55	0.33–0.91		
Motor disability						
No	12 (36.4)	46 (79.3)	1	–	1.82	1.12–2.95
Yes	21 (63.6)	12 (20.7)	0.46	0.29–0.73	1	–
Cognitive disability						
No	3 (9.1)	28 (48.3)	1	–		
Yes	30 (90.9)	30 (51.7)	0.55	0.42–0.73		
Number of disabilities						
0	2 (6.1)	24 (41.4)	1	–		
1	11 (33.3)	26 (44.8)	0.76	0.60-0.97		
2	20 (60.6)	8 (28.6)	0.31	0.17–0.56		
Behavioural disorder						
No	9 (27.3)	30 (51.7)	1	–	1.26	1.01–1.60
Yes	24 (72.7)	28 (48.3)	0.70	0.52–0.95	1	–
Depression						
No	23 (69.7)	53 (91.4)	1	–		
Yes	10 (30.3)	5 (8.6)	0.48	0.23–0.99		
GOSE						
Recovery	2 (6.1)	36 (62.1)	1	–		
Moderate disability	11 (33.3)	18 (31.0)	0.66	0.49–0.88		
Severe disability	20 (60.6)	4 (6.9)	0.18	0.07–0.43		
Change in marital status						
No change	26 (78.8)	35 (60.3)	1	–		
To “Single, divorced”	6 (18.2)	5 (8.6)	0.79	0.40–1.57		
To “Couple, married”	1 (3.0)	18 (31.0)	1.65	1.30–2.10		
Health insurance payments						
No	9 (27.3)	34 (58.6)	1	–		
Yes	24 (72.7)	24 (41.4)	0.63	0.46–0.87		
Help in work adaptation						
Disabled worker’s status						
No	30 (90.9)	30 (51.7)	1	–	1	–
Yes	3 (9.1)	28 (48.3)	1.81	1.34–2.38	1.26	1.01–1.60

Data are prevalence ratio (PRs) and 95% confidence interval (CI) unless indicated. GOSE: Extended Glasgow Outcome Scale.

Table 3
Factors associated with earlier return to work on multivariable analysis.

	HR	[95% CI]	Adjusted HR	[95% CI]
Educational level				
No school-leaving certificate	1	–	1	–
Higher	2.50	1.25–5.00	2.31	1.14–4.70
School-leaving certificate (*Baccalauréat*)	1.68	0.88–3.20	2.20	1.06–4.56
Socio-occupational category (PCS 2003 classification, INSEE)				
White-collar	1	–		
Artisan/shopkeeper/company director	2.33	0.27–20.17		
Executive/higher intellectual profession	4.15	1.10–15.64		
Intermediate profession	1.02	0.36–2.92		
Manual worker	0.92	0.36–2.35		
Occupational status				
Permanent contract	1	–		
Short-term contract/sick leave/temporary/out of work	0.39	0.14–1.11		
Student	1.88	1.05–3.37		
Self-employed	1.87	0.25–14.02		
Coma duration				
<21 days	1	–		
≥ 21 days	0.40	0.19–0.83		
Motor disability				
No	1	–	1	–
Yes	0.49	0.25–0.94	0.34	0.15–0.76
GOSE				
Recovery			1	–
Moderate disability			0.49	0.27–0.91
Severe disability			1.48	0.44–5.02
Number of disabilities				
0	1	-		
1	0.56	0.32–0.99		
2	0.34	0.14–0.79		
Help to return to work				
Rehabilitation course				
No	1	–		
Yes	0.42	0.23–0.78		
Disability centre guidance				
No	1	–		
Yes	0.47	0.27–0.81		
Health insurance payments				
No	1	–	1	–
Yes	0.43	0.25–0.73	0.40	0.22–0.71
Help in work adaptation				
Disabled worker's status				
No	1	–		
Yes	0.55	0.32–0.94		
Sheltered workshop				
No	1	–		
Yes	0.30	0.10–0.84		

Data are hazard ratios (HRs) and 95% confidence intervals (Cis). GOSE: Extended Glasgow Outcome Scale.

3.4. Factors associated with RTW delay

On univariate analysis, variables associated with earlier RTW were higher educational level, executive/higher intellectual professional occupation, stable pre-trauma occupational status, <21 days of coma, and absence of motor disability (Table 3).

The likelihood of the multivariate analysis model was 335.5. Delay to RTW was twice as long for patients receiving help with RTW in the form of a training course in a socio-occupational rehabilitation unit and guidance by a local disabled persons' centre and with national health insurance payments than for others (Table 3). Moreover, later RTW was associated with help in adapting the working conditions such as disabled worker status and sheltered work. The impact of initial GCS score (range 5–9 vs 3–4) was not associated with delay to RTW.

4. Discussion

4.1. High rate of long-term RTW after severe TBI

The present study found that that nearly two-thirds of participants with severe TBI were able to RTW after a mean of 20 months; three-quarters of these went back to their previous job, and just over half were still working at more than 6 years post-trauma. These rates are higher than in previous reports, in particular when the proportion of severe trauma patients is taken into account (e.g., 38% at 4 years [29]). Among longer-term investigations published, Andelic et al. [30] also found a high rate of RTW (58% at 10 years), but the population included both severe and moderate TBI patients. Similarly, Fleming et al. [31], who investigated 446 patients after a mean of 3.5 years of follow-up, including 208 cases of severe TBI, reported that 46.5% of patients returned to work, 74.5% to the same or a similar job. In the present study, for participants who changed jobs, the new job usually required less qualifications than the pre-trauma one. The socio-occupational group that included executives and higher intellectual professionals returned to work sooner than did white-collar and manual workers. This result agrees with the literature, showing that patients with "intellectual" jobs as well as those with "responsibility" returned to work more easily than those doing "physical" work [31,32].

4.2. Factors associated with long-term RTW

Comparison of the present study to previous investigations requires consideration of the diversity of interpretative frameworks. In this regard, the present study involved a cohort of patients

undergoing rehabilitation. In addition, the RTW of a disabled person depends on the socio-economic and cultural context as well as the health and occupational rehabilitation policies of the particular country. The present study concerns the French social and healthcare system, and in 2013, according to data from the Organisation for Economic Cooperation and Development, France was the member-state with the highest proportion of gross domestic product devoted to social protection: 32%, or more than €600 billion, as compared with 28.2% in Sweden, 25.6% in Germany, 22.54% in the United Kingdom, 19.6% in the United States, and 19% in Australia. Second, the initial employment rate (68.8%) of our population (excluding students) was higher than that of the general French population in 2005 (63%) or 2009 (65%); moreover, the share of graduates (28.1%) was greater than the general French population in 2005 (22%) or 2009 (25%; according to data from the French office for national statistics). Being in work before the trauma [33] and high educational level [34,35] both were reported to be factors of good prognosis for RTW, which we confirmed. Furthermore, our finding of the association of GCS with RTW is consistent with previous reports identifying GCS as a predictor of poor RTW after a severe TBI at the population level [29,35]. However, in the present cohort, some participants with a low initial GCS score (3 or 4) did RTW and the initial GCS should be considered carefully when dealing with the prognostication at the individual level. In addition, differences in methodology (type of study, length of follow-up, details of occupational data, etc.) and in the definition of RTW result in a wide heterogeneity of results, which hinders comparison between studies. The criteria for a successful RTW should take into account first the participant's capacity to resume the former job or undertake another job and then the capacity to remain in work over the medium and long term.

4.3. A long-term follow-up is crucial to assess RTW in severe TBI

Some longitudinal studies have reported that the rate of employment increases in the years after TBI [34,36], whereas others found a more negative trend toward unemployment after TBI [37,38]. These findings seem to indicate that RTW is rarely stable over time, and there is a need for methodological consensus in future studies that should investigate more than 5 years of follow-up to be able to analyse long-term job stability. Individuals with motor disability, referred to sheltered employment, or who received national health insurance payments or help with RTW (guidance or rehabilitation) all returned to work later than others. This observation may be due to motor sequelae (hemiplegia, balance disorder, etc.) hindering access to and travel to the workplace. Motor disability also casts doubt on the ability to drive, which is supported by results presented by Klonoff et al., who reported better occupational prognosis for patients able to resume driving [39]. Moreover, patients with delayed RTW are mainly in less well-qualified socio-occupational categories, with disabling sequelae and more than 2 years sick leave with disability pension or work accident benefits [40]; thus, returning to work is not always an economic necessity and could even be disadvantageous. In this study, it often took a long time to set up measures and assess the aptitude for work, which may have led to a loss of motivation in some cases. For example, the waiting time for vocational rehabilitation is about 6 months, and the course itself lasts another 6 months. Moreover, there are disparities in the organisation and accessibility of help and accompaniment according to the urban or rural setting or administrative region. In general, rehabilitation programmes and measures to help RTW have not given sufficient proof of efficacy in terms of job stability [40].

4.4. Disabled worker status facilitates long-term RTW

However, we found disabled worker status associated with RTW. This observation opens the way for technical and financial resources to adapt the work situation and obtain help with RTW. Obtaining disabled worker status takes a long time, and it is advisable to launch the process (with the local disabled persons centre) as soon as possible. Healthcare professionals should provide their patients with the relevant information, because disabled worker status can be a key tool in RTW. This finding was confirmed by a recent systematic review, which suggested that the chances of patients with cerebral lesions (whether traumatic or not) returning to work were greater when the employer adhered to recommendations for working conditions and work-place adaptation [41]. Moreover, accompaniment within the company and workforce facilitates RTW and medium-term (4–8 years) job stability, which suggests a need for specific occupational accompaniment with early involvement of the occupational physician (pre-return consultation) [42] and the employer to optimise conditions [43,44]. Other specificities of the individual company, such as size, also need to be taken into account because changing jobs within small or very small companies (< 50 and < 10 employees, respectively) is difficult.

The strengths of the present study include a well-defined and delimited population of severe TBI individuals from a single geographical area, with a standardised data collection methodology. However, limitations include loss to follow-up, small sample sizes for certain socio-occupational categories, memory bias due to the long trauma-to-study interval, and the subjective nature of self-reported data from a population with cranial lesions liable to involve anosognosia and cognitive disorders.

Overall, the present results are encouraging, inasmuch as most patients were able to RTW several years post-trauma despite all the personal, familial and occupational obstacles encountered along the way. However, reaching any precise conclusion about individual occupational prognoses, given the varied clinical symptomatology and multiplicity of determining factors, is difficult. Further studies based on French data in larger severe TBI population at more than 5 years of follow-up will be needed to complete the present findings and shed further light on how these patients achieve stable employment.

5. Conclusion

The results of this French study show that most victims of severe TBI were able to return to work after prolonged unemployment. This study highlights the multiple determinants involved in RTW and the role of socioenvironmental factors.

Disclosure of interest

The authors declare that they have no competing interest. The authors alone are responsible for the content and writing of the paper.

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Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at http://.dx.doi.org10.1016/j.rehab.2018.08.003.

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