

The Correlation of Patients with Spinal Cord Injury and Psychiatric Disorders

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Introduction

- Spinal cord injury (SCI) is a common devastating accident in modern society. The primary cause of SCI is motor vehicle accidents (38%), falls (30.5%), acts of violence, (13.5%), sports/recreation activities (9%), and males account for approximately 80% of new SCI cases (National Spinal Cord Injury Statistical Center, 2016).

Method

- *Data source*

The study was approved by the ethics review boards of Chang Gung Memorial Hospital (approval number 104-5772B) and the National Health Research Institutes, Taiwan.

We used Taiwan patient hospital data from the National Health Insurance Research Database (NHIRD) from 1997 to 2009. The National Health Insurance Research Database (NHIRD) provided anonymized individual-level patient data collected from all Taiwan-licensed hospitals.

Study cohort

- This study was based on data obtained from the NHIRD, patients aged <18 years and those with incomplete National Health Insurance claims, unclear sex, or missing were excluded. Patients with depression, bipolar disorder, anxiety, mental illness, alcohol-related syndrome, suicide attempt, emotional psychosis, schizophrenia, and depression were included.

Psychiatric disorder status

- According to the previous studies(Hoeffding et al., 2017; Huang et al., 2016; Lim et al., 2017b) and clinical experiences, the present study selected patients with a primary psychiatric disorder related diagnosis were included if they had the following (ICD 9) codes.

(ICD 9) codes

- Depression (ICD 9 296.2, 296.3, 300.4, 311), bipolar disorder (ICD 9 296.0, 296.1, 296.4, 296.5, 296.6, 296.7, 296.8, 296.80, 296.89), anxiety (ICD 9 300.0, 300.2, 300.3, 308.3, 309.81), mental illness (ICD 9 295.0-295.9, 297.1, 298.8, 298.9), trauma and stress-related disorders (ICD 9 309.81), cognitive disorders (ICD 9 331.83), mood disorder (ICD 9 293.83), schizophrenic disorders, disorganized type (ICD 9 295.10), and schizophrenia (ICD-9 295.80).

Spinal cord injury status

- The definition of spinal cord injury was based on that presented in the study by following characteristics: a primary diagnosis of a spinal cord injury condition (ICD- 9 codes 806, 952).

Analysis

- Descriptive statistics are used to report the results, and the data are presented as frequencies, means \pm standard deviations, and/or proportions.
- The factors associated with in the patients with SCI were determined.

Analysis

- Inferential statistics were used to control for demographic characteristics and SCI, and Cox proportional hazard models were used to compare differences hazard ratios (HRs) and 95 % confidence interval (CI). All statistical analyses were performed using SAS for Windows version 9.3 (SAS Institute, Cary, NC).

Propensity score matching

- We chose the propensity score matching method as our primary approach (Zagar, Kadziola, Lipkovich & Faries, 2017).

Cox proportional hazard model

- The Cox proportional hazards method was used to compare differences in hazard of psychiatric disorder between the matched SCI groups and Non-SCI group.

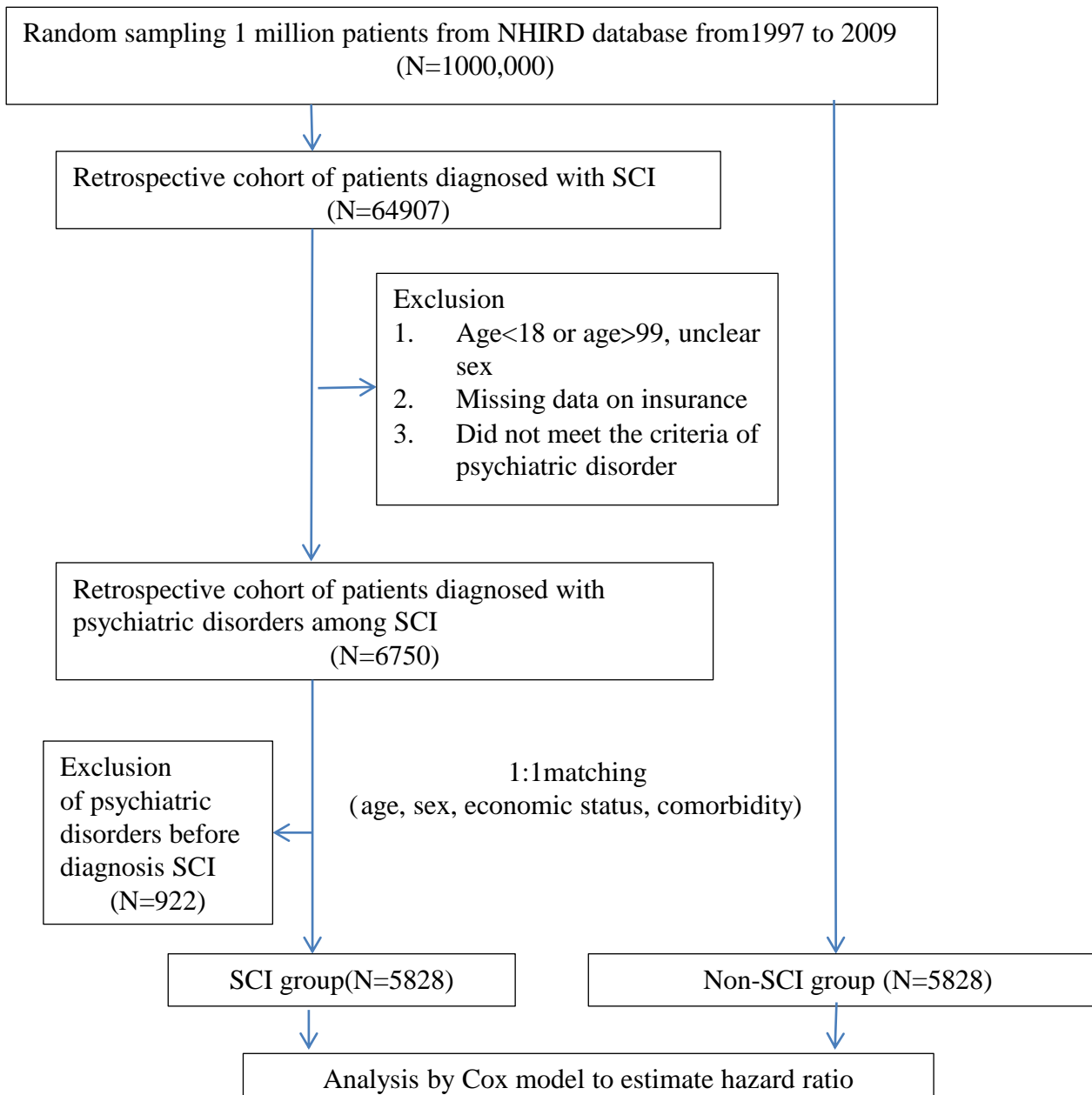


Figure 1. Flowchart of the sample selection of SCI

Results

- Among the persons with SCI, the proportion of female persons was less and the males, and the average age was higher than those without SCI. The greater part of patients were men (n =2985, 51.2%), the average age of all the persons among SCI was 52.8 years (standard deviation ± 18.2).

Results

- The matched SCI groups and Non-SCI groups had significant standardized differences across these matched variables in the matching process. All of 5828 newly diagnosed psychiatric disorders were investigated from 1997 to 2009 in 64907 SCI in the dataset.
- A main type in SCI was cervical injury (n =1809, 31.03%), followed by lumbar injury (n =1530, 26.3%).

Risk factors predicting psychiatric disorder among SCI

- Kaplan–Meier free survival analysis indicated that the psychiatric disorder notably declined in the SCI group, in contrast to non-SCI group.

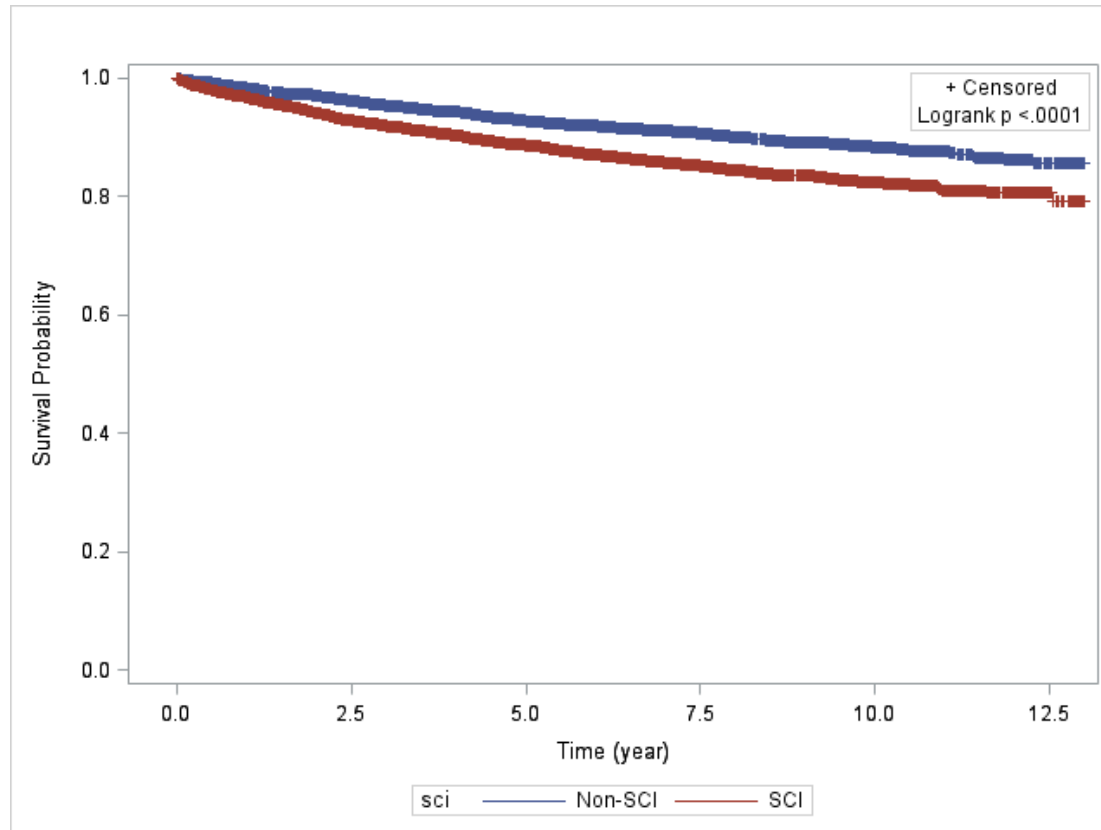


Figure 2. Psychiatric disorder-free survival rate in patients with and without Spinal Cord injury (SCI), as estimated using the Kaplan–Meier method (log-rank test; $p < 0.001$)

Matched psychiatric disorder in SCI group analyses

- The COPD had a considerable influence on the risk of psychiatric disorder; the hazard risk was greater than that of other comorbidity.
- The HTN was also considerably associated with psychiatric disorder risk.

Conclusions

- To our knowledge, this is the first retrospective cohort study in Taiwan to follow over 7440 SCI for 12 years. Utilizing 12-year Taiwan's National Health Insurance Research Database (1997-2009) among SCI patients in Taiwan, we found that the occurrence of newly diagnosed psychiatric disorder was generally increased with female gender and age.

Conclusions

- This analyses indicated the mean age of all the patients with SCI was 52.8years (standard deviation ± 18.2) in Taiwan. Although anxiety and depression are theoretically common health problem in patients with SCI, but limited data are available on the association between psychiatric disorder and SCI.

Conclusions

- This study used ICD-9-CM codes to define psychiatric disorder and found that newly diagnosed psychiatric disorder among spinal cord injury compared to individuals with other health conditions in the long term.

Conclusions

- In present study, we observed that psychiatric disorders patients with SCI were at risk of developing HTN (HR 1.263, 95 % CI 1.110–1.449, $P = .0009$), which was much higher in our results.

Conclusions

- The risk of COPD of psychiatric disorder after SCI was (HR 1.364, 95 % CI 1.180–1.578, $P < .0001$), the hazard ratio with clinically significant in our study.
- Our study suggested that SCI can advance the deterioration of comorbidity (e.g., HTN, COPD) and have negative expectations of the future.

Conclusions

- Previous studies revealed that psychological factors, such as depression, may contribute to premature mortality among SCI victims (Kennedy, Kilvert & Hasson, 2016).
- Our research sought to identify factors associating psychiatric disorder and SCI.



Strengths and Limitations

- The present study has several strengths, including the capability to track a large SCI cohort during an essential period. The study linkage may be the only practical method to discuss the issue. Nevertheless, the present study has some limitations. First, the propensity score algorithm did not exclude the Non-SCI group with indications of some issues like alcohol abuse.



Strengths and Limitations

- This is especially true with the potential effects of alcohol drinking across SCI groups, which may have contributed to the similar occurrence type seen in Non-SCI groups. In addition, data subjects were restricted to having severity adequate to be given a medical diagnosis.

Strengths and Limitations

- Also, a dose-response relationship could not be assessed. Moreover, the potential ascertainment bias and misclassification bias may be present.

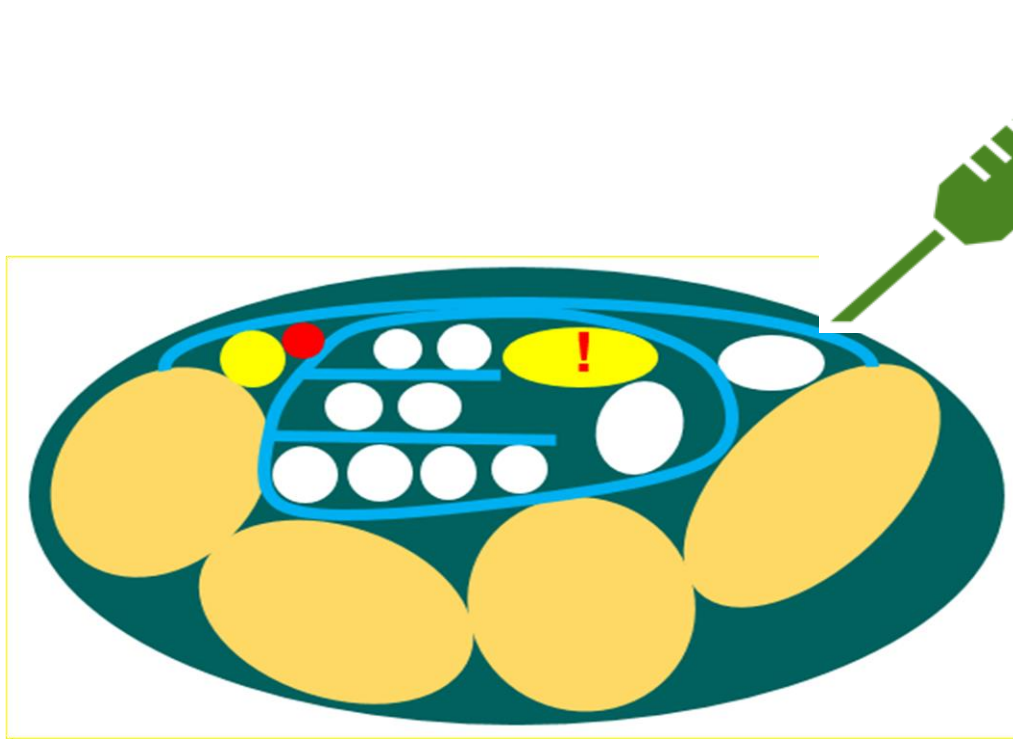
Relevance to clinical practice

- The results of this population-based, retrospective cohort study provided that patients with SCI are at a risk of developing psychiatric disorders.
- The findings indicate that the effects of, level of SCI, age, female sex, and comorbidity, respectively, influence the occurrence of newly diagnosed psychiatric disorders with SCI.

Relevance to clinical practice

- The study showed that psychiatric disorders may be associated with the development among SCI patients, and that this risk was more predominant in female SCI patients.
- Our results are of direct clinical relevance to assist clinical ascertainment, counseling, guidance of symptomatic monitoring, and early clinical intervention.

Thanks for your attention!



 Helen
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