

PICO Search Assignment Worksheet

Name: Jay Kolasinac

44-year-old, African American, male, domiciled with mother, employed, w/ PMH of seizure disorder, secondary to TBI 3 years ago, presents to the CPEP for bizarre behavior x 8 months. Patient is suspected of developing schizophrenic symptoms.

Search Question: In patients with a history of traumatic brain injury, is there an increased risk for developing schizophrenia?

Question Type: What kind of question is this? (boxes now checkable in Word)

- Prevalence Screening Diagnosis
- Prognosis Treatment Harms

Assuming that the highest level of evidence to answer your question will be meta-analysis or systematic review, what other types of study might you include if these are not available (or if there is a much more current study of another type)?

Please explain your choices.

Besides meta-analyses or systematic reviews, cohort studies, either prospective or retrospective, would be other types of studies that I will be watching out for. Particularly prospective cohort studies where patients are followed over a period of time and observed.

PICO search terms:

P	I	C	O
Adults	Traumatic brain injury	None	Schizophrenia
	TBI		Increased risk for schizophrenia
			Risk factor schizophrenia

Search tools and strategy used:

Please indicate what data bases/tools you used, provide a list of the terms you searched together in each tool, and how many articles were returned using those terms and filters.

Explain how you narrow your choices to the few selected articles.

Database	Terms	Filter	# of Articles
PubMed	(traumatic brain injury) OR TBI) AND schizophrenia) AND risk factor	Medline, last 5 years	2234
ScienceDirect	Traumatic brain injury schizophrenia	Research articles, last 10	170

		years, psychology, schizophrenia research	
MEDLINE Complete	Traumatic brain injury schizophrenia	Last 10 years, academic journals	178

There definitely was a lot of research regarding TBIs and schizophrenia separately, I tried to find articles that directly focused on my PICO question and not articles that perhaps had 1 or 2 lines about my question.

Results found:

ARTICLE 1

<p>CITATION Chen, Y.-H., Chiu, W.-T., Chu, S.-F., & Lin, H.-C. (2010). <i>Increased risk of schizophrenia following traumatic brain injury: a 5-year follow-up study in Taiwan. Psychological Medicine, 41(06), 1271–1277.</i> doi:10.1017/s0033291710001819 https://sci-hub.se/https://doi.org/10.1017/s0033291710001819</p>
<p>ARTICLE TYPE Systematic Review</p>
<p>ABSTRACT Background. Whether traumatic brain injury (TBI) is an independent risk factor for the subsequent development of schizophrenia has evoked considerable controversy. No evidence has been previously reported from Asia. This study estimated the risk of schizophrenia during a 5-year period following hospital admission for TBI relative to a comparison group of non-TBI patients during the same period in Taiwan. Method. Two datasets were linked : the Traumatic Brain Injury Registry and the Taiwan National Health Insurance Research Dataset. A total of 3495 patients hospitalized with a diagnosis of TBI from 2001 to 2002 were included, together with 17 475 non-TBI patients as the comparison group, matched on sex, age, and year of TBI hospitalization. Each individual was followed for 5 years to identify any later diagnosis of schizophrenia. Cox proportional hazard regressions were performed for analysis. Results. During the 5-year follow-up period, patients who had suffered TBI were independently associated with a 1.99-fold (95% confidence interval 1.28–3.08) increased risk of subsequent schizophrenia, after adjusting for monthly income and residential geographical location. The severity and type of TBI was not associated with the subsequent development of schizophrenia. Conclusions. Our findings add important evidence from Asia and suggest a potential link between TBI and schizophrenia. Our study suggests that clinicians and family members should be alert to possible neuropsychiatric conditions following TBI.</p>

KEY POINTS

- Systematic review of case studies between the years 1971-1994
- Potential link between TBIs and Schizophrenia development
- 1.99-fold increase in developing schizophrenia following a TBI
- Severity of TBI did not matter

REASON FOR CHOOSING:

- This article focused directly on my PICO question
- Systematic review within last 10 years
- Involved over 3,400+ patients

Article 2**CITATION**

Molloy, C., Conroy, R. M., Cotter, D. R., & Cannon, M. (2011). *Is Traumatic Brain Injury A Risk Factor for Schizophrenia? A Meta-Analysis of Case-Controlled Population-Based Studies. Schizophrenia Bulletin, 37(6), 1104–1110.* doi:10.1093/schbul/sbr091
<https://sci-hub.se/https://doi.org/10.1093/schbul/sbr091>

ARTICLE TYPE

Meta-analysis

ABSTRACT

Traumatic brain injury (TBI) is known to lead to a range of adverse psychiatric sequelae but the question of whether TBI is a risk factor for psychosis and, in particular, schizophrenia remains unclear. Studies examining this issue have yielded conflicting results. We carried out a systematic review of the literature on TBI and psychosis in order to identify all population-based controlled studies which provide estimates of risk for schizophrenia following TBI. Odds ratios (ORs) were combined using random effects meta-analysis. Our literature search yielded 172 studies which were considered to be potentially relevant. From these, we identified 9 studies that could provide estimates of risk in the form of ORs. The pooled analysis revealed a significant association between TBI and schizophrenia (OR 5 1.65; 95% CI 5 1.17–2.32), with significant heterogeneity between the studies. Estimates from the family studies (OR 5 2.8; 95% CI 5 1.76–4.47) were higher than those from the cohort/nested case-control studies (OR 5 1.42; 95% CI 5 1.02–1.97) by a factor of almost 2. There did not appear to be a dose-response relationship between severity of head injury and subsequent risk of schizophrenia. This meta-analysis supports an increased risk of schizophrenia following TBI, with a larger effect in those with a genetic predisposition to psychosis. Further epidemiological and neuroscientific studies to elucidate the mechanisms underlying this association are warranted.

KEY POINTS

- 9 studies were included yielded from over 9,000+ references
- Significant association between TBI and schizophrenia
- No relationship between severity of TBI and development of schizophrenia
- Larger effect seen in patients with genetic predisposition to schizophrenia

- More studies need to be conducted to determine the underlying mechanism
- Difficult to say whether the TBI caused the psychosis or whether the individual was already on the pathway to developing schizophrenia even before the TBI
- Those with family history of schizophrenia are more at risk following TBI

REASON FOR CHOOSING:

- Meta-analysis
- Study directly focusing on my PICO question
- Included different types of case-controlled studies [nested case-control studies, cohort studies, and family studies]
- Published within last 10 years

ARTICLE 3

CITATION

Fujii, D., & Fujii, D. C. (2012). *Psychotic Disorder Due to Traumatic Brain Injury: Analysis of Case Studies in the Literature. The Journal of Neuropsychiatry and Clinical Neurosciences*, 24(3), 278–289. doi:10.1176/appi.neuropsych.11070176

<https://sci-hub.se/https://doi.org/10.1176/appi.neuropsych.11070176#>

ARTICLE TYPE

Meta-analysis

ABSTRACT

The present study utilized methodology from a previous descriptive study that analyzed case studies of psychotic disorder due to traumatic brain injury (PD-TBI) reported in psychiatry and neurology journals. The purpose was to replicate findings from the PD-TBI literature and to elucidate a pattern of characteristics that would differentiate PD-TBI from schizophrenia. The findings supported both objectives. PD-TBI data were highly consistent with previous studies: PD-TBI differed from schizophrenia in showing more focal frontal and temporal abnormalities on neurological studies and a lower rate of negative symptoms. The authors discuss implications of these findings for conceptualizing psychosis as a neurobiological syndrome.

KEY POINTS

- Persons who develop a psychotic disorder, i.e. schizophrenia, have a premorbid vulnerability including genetic predisposition for schizophrenia or other neurological or psychiatric conditions.
- 34 articles were included in the analysis which included 64 case studies
- Bimodal distribution of time between TBI and onset of psychosis. Many develop psychosis within 1 year after TBI or after 5 years.
- Average age of onset following TBI for development of psychosis was 3.6 years
- Male gender and family hx of schizophrenia are risk factors for developing psychosis following TBI

REASON FOR CHOOSING

- Meta-analysis
- Published within 10 years
- Focused on my PICO question

What is the clinical “bottom line” derived from these articles in answer to your question?

Based on these three articles, there is an association between traumatic brain injuries and the development of psychotic disorders, such as schizophrenia. There is a higher risk of developing schizophrenia following TBI by as much as 2x the risk of a normal individual [Chen et al] and the risk is greater in patients who are already at risk for development of schizophrenia prior to TBI, such as family history and genetic predisposition [Molloy et al and Fujii et al]. The issue here is that there is not concrete evidence to determine if the TBI causes schizophrenia in patients or simply brings about a quicker onset of psychosis because these individuals who are experiencing schizophrenic symptoms were already at a genetic disadvantage and the TBI simply sped up the process to expression of the disease. More studies need to be conducted to determine this fact. For patients who displayed no symptoms of psychotic disorders but have a family history of psychotic disorders, such as schizophrenia, health screening should be conducted if these patients were to suffer a TBI, not matter the severity of the injury [Molloy et al].