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EMERGENCY NURSING ANALYSIS PREVENTION AND TREATMENT OF COGNITIVE DYFUNCTION AFTER TRAUMATIC BRAIN INJURY: LITERATURE REVIEW

Purwokerto

Galih Noor Alivian[1*], Arif Imam Hidayat[2], Sidik Awaludin[3], Iwan Purnawan[4]

[1,2,3,4]Department of Nursing, Faculty of Health Sciences, Jenderal Soedirman University,

[1*]Correspondence Author :
Galih Noor Alivian; Department of Nursing, Faculty of Health Sciences, Jenderal Soedirman University, Purwokerto.
galih.alivian@unsoed.ac.id

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ABSTRACT

Introduction: Traumatic brain injury or traumatic brain injury according to the national consensus of treatment head trauma defines traumatic brain injury as mechanical trauma to the head either directly or indirectly that can cause disturbance neurological functions such as physical, cognitive and psychosocial disorders both temporarily nor permanent. This literature review aims to determine the prevention and treatment of cognitive dysfunction after traumatic brain injury. Literature search with using the ProQuest, PubMed, Garuda and Google Scholar databases with 2017-2022 publication range. Articles that meet the criteria are analyzed and rated quality according to inclusion and exclusion. Obtained ten articles discussing related to the prevention and treatment of cognitive dysfunction after traumatic brain injury, two articles using the literature review method. The results of the analysis of the 5 articles show below there are various alternatives can be used in the prevention and treatment of people with cognitive dysfunction or disorders positive after traumatic brain injury such as the use of trehalose drugs, computer-assisted cognitive stimulation or neurocognition, use of neurofeedback, prophylactic therapy, neuroradiographic imaging and basic and optional neurologic examinations use of anti-epileptic drugs (OATs). Until now there is no therapy that can be applied for primary brain injury, therapy for people with cognitive impairment focused on neurocognitive rehabilitation in cognitive impairment after traumatic brain injury..

Keywords: Traumatic Brain Injury, cognitive dysfunction.

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INTRODUCTION

Indonesia is one of the developing countries where the number of mortality and disability due to injury is very high. Especially the injuries caused by traffic accidents due to the increase in motorization, this is the main cause of traumatic brain injury that can ending in death. According to the World Health Organization (WHO) in (Atrid C. Awaloei, 2016) suggests that every year nearly 1.2 million people died and millions more suffered traumatic brain injury or disability as a result of a traffic accident.

The results of basic health research (Ministry of Health RI, 2018) shows that the prevalence of brain injury or head injury in Indonesia is at 11.9%. Injuries to the head occupy positions third after injury to the lower limb, which is 67.9% and injuries to the upper limbs by 32.7%. There are two causes that can result in brain injury, namely: caused by traumatic brain injury or traumatic brain injury and brain injury caused by acquired brain injury.

Traumatic brain injury or traumatic brain injury according to consensus The national head for trauma management defines that brain injury traumatic as mechanical trauma to the head either directly or indirectly that can cause neurological dysfunction such as physical, cognitive and psychosocial functioning disorders, both temporary and permanent.Based on the severity of traumatic brain/head injury in classified into

mild, moderate and severe brain injury.

Research conducted by (Sari Wahyu Ningrum, Indrawati Setyaningsih and Ahmad Asmedi, 2016) suggested that rehabilitation conventional cognitive post-head injury did not show good results On the other hand, using neurofeedback can provide Significant advances in the treatment of post-head injury cognitive impairment light to heavy effectively and safely so that its use can be recommended for application to all classifications of head injury and applied as early as possible after injury.

(Dewi Yulianti Bisri, 2015) in her research entitled "Prevention and Treatment of Cognitive Dysfunction After Brain Injury Traumatic" states that to date there is no therapy for the injury primary brain and therapy is to reduce injury secondary injury triggered by a primary injury so that it generally remains use of neuroanaesthesia/neuroresuscitation and specifically with infusion of lindocaine, hypertonic sodium lactate, cholinergic drugs, catecholaminergic and tricyclic antidepressants.

Based on the description in the paragraph above, an intervention is needed in the form of prevention and appropriate treatment for brain injury sufferers traumatic so that this is the background for researchers to conduct studies literature review with the title "Emergency Nursing Analysis Prevention and Treatment of Cognitive Dysfunction After Brain Injury Traumatic". Researchers chose to use the literature review method due to the covid-19 pandemic which is still happening so no it is possible to conduct research directly into the facility health services.

METHOD

The design used in this study using the Preferred Reporting Items for Systematic Review and Meta-analyses (PRISMA) method. This method is done using review, study, structured evaluation, classifying, and categorizing previously produced evidence-based. This review literature aims to prevent and prevent the treatment of cognitive dysfunction after traumatic brain injury. Literature search using the ProQuest, PubMed, Garuda and Google Scholar databases with a publication range of 2017-2022. Articles that meet the assessment criteria and the quality is according to inclusion and exclusion. There were ten articles discussing the prevention and treatment of cognitive dysfunction after traumatic brain injury, two of which used the literature review method. The results of the analysis of the 5 articles show that there are various alternatives that can be used in the prevention and treatment of people with cognitive dysfunction or impairment after traumatic brain injury such as the use of trehalose drugs, computer-assisted cognitive stimulation or neurocognition, use of neurofeedback, prophylactic therapy, neuroradiographic imaging and basic neurological examination and choice of anti-epileptic drug use (OAT).

RESULT

In this chapter the author will discuss from 5 articles that discuss about prevention and treatment of cognitive dysfunction in traumatic brain injury patients. Based on the research results of previous researchers, it can be shown that To manage head injury effectively, it is necessary to understand anatomy basic and good physiology of the head and brain. Head injuries that occur can be in the form of bruising of brain tissue followed by swelling and increase in intracranial pressure, injury to blood vessels with bleeding and increased intracranial pressure or penetrating injury that damages brain tissue. (maintaining certain nutrients such as vitamins).

Traumatic brain injury (hereinafter abbreviated as COT) can cause various problems and complications, one of which is seizures, or in the long term can become epileptic. In 6% of people with epilepsy, seizures are thought to be related to previous head trauma, and are generally difficult controlled with standard anti-epileptic drugs (OAE) (Ruslami & Bisri, 2016).

In connection with this research conducted by (Ruslami & Bisri, 2016) using anti-epileptic drugs for seizure prophylactic therapy in Traumatic Brain Injury, Prophylactic therapy is recommended in just 7 days post COT, especially if there are risk factors for early PTS. There isn't any evidence to support the administration of prophylactic therapy for more than 7 days, although in patients with risk factors. The current literature supports the use of OAE in one week first post-severe COT (GCS <8) to prevent early PTS. Prophylactic therapy given in the first 1 week after COT, and will be especially beneficial for patients with risk factors for seizures. The incidence of early PTS is not associated with poorer therapeutic outcomes.

However, because the incidence is sufficient high, prophylactic therapy reduces the incidence of early PTS, and approximately 6% of epilepsy associated with a previous head injury, then this prophylactic therapy can considered. It was emphasized that there is no evidence that prophylactic therapy can be useful in preventing late PTS, even in patients with -factor risk.

The reason for giving OAE immediately after COT occurs is based on the presence of: desire to prevent the emergence of epilepsy in later life. Beside seizures and epilepsy, COT is often accompanied by immediate neurologic deficits as well as long term. In another article stated that cognitive impairment in patients with traumatic brain injury in several studies stated that there is a significant relationship between age and cognitive function, the older a person's age patients, the decline in cognitive function is more severe (Pramana et al., 2019).

In addition to the use of anti-epileptic drugs (OAT), the use of trehalose is also a choice and management of traumatic brain injury, as we know that trehalose itself is a sugar consisting of two glucose molecules that have a retention

very high water content and is used in food, cosmetics and as medicine. The results suggest that trehalose may be effective in increasing functional outcome after traumatic brain injury or traumatic brain injury (Portbury et al., 2017). However, the researcher believes that it still has to be done a more in-depth study with samples in patients with traumatic brain injury to prove the positive effect of trehalose on humans.

In addition to OAT and trehalose, there are various drugs that can be used

for people with traumatic brain injury as research conducted by (Dewi Yulianti Bisri, 2015) namely Cholinergic Physostigmine (not recommended) Cytidine-5'-diphosphocholine, catecholaminergic drugs, Psychostimulants, Amantadine Bromocriptine, Levodopa, Other Tricyclic Drugs in the form of antidepressants, Selective serotonin reuptake inhibitor antidepressants, Pergolide, pramipexole, ropinirole (other dopamine receptor agonists, Atomoxetine (selective norepinephrine reuptake inhibitor), Guanfacine (selective 2A-adrenergic agonist). However, in this study it was stated that some drugs that used the results are still not satisfactory.

In addition to treatment, prevention of cognitive dysfunction or impairment in patients with traumatic brain injury, the two articles in this literature review discuss related neurocognition or cognitive stimulation. Based on the results of the study, the results obtained that with cognitive stimulation exercises given to people with impaired cognitive abilities after traumatic brain injury experienced a decrease in the number of subjects receiving experienced cognitive impairment significantly by 46.7% percent compared to with the control group which is only 23.3%. In this case cognitive intervention with the help of a computer has a larger effect size compared to quantitative EEG guided biofeedback, computers, strategies, and medication.

In line with this (Dewi Yulianti Bisri, 2015) stated that line therapy is focused on neurocognitive rehabilitation in cognitive disorders after traumatic brain injury although there is currently no therapy for primary brain injury and therapy is to reduce the secondary injury triggered by the injury primary. Besides that relative lack of standardization in neuropsychological assessment strategies for measuring Alasisa adds to the challenges in the process of treating people with brain injuries traumatic (Calvillo & Irimia, 2020). (Sari Wahyu Ningrum, Indarwati Setyaningsih, 2016), in his research entitled The benefits of neurofeedback in therapy cognitive impairment after head injury with the literature study method suggests that "Currently conventional post-head injury cognitive rehabilitation is not show meaningful results. While the results of the critical analysis of the study The literature conducted shows that neurofeedback is effective, safe, and significantly used in the treatment of cognitive disorders after mild head injury until heavy.

CONCLUSION

Use of drugs such as cholinergic drugs Physostigmine (not recommended) Cytidine-5'-diphosphocholine, Catecholaminergic Drugs, Psychostimulants, Amantadine Bromocriptine, Levodopa, Other Tricyclic Drugs in the form of antidepressants, Selective serotonin reuptake inhibitor antidepressants, Pergolide, pramipexole, ropinirole (other dopamine receptor agonists, Atomoxetine (selective norepinephrine reuptake inhibitor), Guanfacine (selective 2A-adrenergic agonist) that can be given to people with cognitive impairment is still not give satisfactory results.

Until now there is no therapy that can be applied to brain injury primary, therapy for people with cognitive disorders focused on

neurocognitive rehabilitation in cognitive disorders tired brain injury ummah. The results of another analysis showed that the use of neurofeedback in head injury patients can be applied to people with post-cognitive impairment mild to severe head injury. Likewise with cognitive stimulation (stimkog) which is an external therapeutic can be given to patients with cognitive multi-domain disorders (attention, memory, language, executive and visual functions).

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Table 1

Reference	Method	Research Site	Results
Stuart D. Portubury, Dominic J.Hare, David I. Finkelstein , Paul A. Adlard	Method: Quasy experiments and designs pretest-posttest research one group design. Sample: 15 men (9 men and 6 females) with NIDDM and obesity.	Guntur District, Andhra Pradesh.	This result shows that trehalose maybe effective in increase yield functional after TBI previously mechanism of action who does not described that have relevance with various proquest system disturbance central nervous system.
(Michael Galgano, Gentian Toshkezi, Xuecheng Qiu, Thomas Russell , Lawrence Chin, and Li-Ru Zhao	Method: Quasi-experimental animal. Sample: 54 wistar rats.	Nigeria	neurobiology and neuroimaging correlated, and with patient age and time evaluation after injury. This review summarizes recent literature on cognitive mTBI dysfunctional, related with neuroimaging, and the relationship for assessment neuropsychological. Discussion about PCS is included for each (sub)cognitive domain as a function of age on injury, time since the injury and rating category other
Maria Calvillo, Andreal Irimia	Method: Experimental Animal. Sample: 32 male wistar rats.	Nigeria	● *Moringa oleifera* leaves (6.49 g / ml) have significantly higher amylase enzyme activity compared to (10.60 g / ml) T. occidentalis leaves. ● Judging from the IC value, *Moringa oleifera* leaves have the ability to clean free radicals (14.18 g / ml) compared to the leaves of T. occidentalis (21.06 g / ml). ● *Moringa oleifera* leaves (4.73 g / ml), have a noticeable influence (p <0,05) higher in glucoside inhibitory activity than T. occidentalis leaves (7.69 g / ml).
Maud Stenberg,1 Alison K. Godbolt, Catharina Nygren De Boussard, Richard Levi, and Britt-	Method: Quasi-Experimental; with moringa leaf group and placebo group. Sample : 32 types 2 diabetes patients aged	Hospital Faculty of Medicine Siriraj Mahidol University Hospital, Thailand.	● After 4 weeks, there was a decrease of 0.2-0.3% HbA1C compared to baseline in both groups. ● There was no incidence of hypoglycemia in both treatment groups had no side effects when consuming moringa leaf powder at high doses.

Marie Stålnacke	20-70 years. With hemoglobin A1C (HbA1C) levels less than 9%, and fasting plasma glucose less than 200 mg/dl.		
Made Ayu Wedariani, Lyna Soertidewi, Silvia Francisna Lumempouw, Herqutanto	Design : Study use quasi design experimental Population : injured patient moderate light head divided over group intervention and control group	Indonesia	Fixed Stimkog . value intervention group greater than control group on time speed, success, failure, and percentage of answers Correct. Post workout Stimkog happens decrease in quantity subject experiencing cognitive impairment in intervention group