



## The Effectiveness of the 30° Head Up Technique for Ineffective of Cerebral Tissue Perfusion in Meningitis Client

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### ABSTRACT

**Objective:** This case study aims to gain direct experience in providing nursing care to children with meningitis with ineffective cerebral tissue perfusion problems.

**Methods:** This study uses a descriptive case study design with a nursing approach. The subject in this research is An. S with meningitis who experienced cerebral tissue perfusion with data collection techniques including interviews, observation, physical examination, and documentation.

**Results:** The results obtained after completing the nursing process include assessment, diagnosis, intervention, implementation, and evaluation within 4 days from 25-30 May 2022. The 30° Head Up Technique to increase awareness and maximize oxygenation to the brain in meningitis patients with deep breathing results normal limits and increased consciousness.

**Conclusion:** Conclusions from Nursing Care of Meningitis Children with brain tissue perfusion problems. With the intervention of the Head Up 30° position technique, it is very effective to increase awareness and avoid recurring seizures.

**Keywords:** cerebral, head up, meningitis, perfussion

### Introduction

Meningitis is a disease that occurs due to infection of the meninges, or membranes that protect the central nervous system of the human body. This infection can occur due to bacterial, fungal, or viral inflammation of the meninges (Hurit, 2021). According to the World Health Organization (WHO) in 2011 there were 14,317 cases of meningitis in Africa with 1,304 deaths. Every year, these cases may affect 400 million people living in 26 countries (Senegal to Utopia). Over 900,000 cases were reported in the last 20 years from 1995 to 2014 meningitis

cases accounted for 10% of deaths. While 10 to 20% leave neurological sequelae (Padang, 2017).

Data from the Republic of Indonesia Ministry of Health in 2015 showed that at the end of 2010, the number of meningitis cases that occurred in Indonesian society based on male sex was 12,010 clients (62.3%), while there were 7,371 women (38.7%). Of these cases, 1,025 (5.3%) sufferers of meningitis died (Rossetyowati et al., 2021). From health data for the province of West Java in 2014, the number of cases of meningitis was reported at around 0.7% (Nurliawati et al., 2016).

The organisms that cause meningitis in children are *Haemophilus influenzae* type B (Hib) and *Streptococcus pneumoniae*. (Nature, 2016). Whereas in immunocompromised adults, *Streptococcus pneumoniae* and *Neisseria meningitidis* are the main causes of bacterial meningitis, because these two bacteria have the ability to colonize the nasopharynx and attack the nasopharyngeal blood-brain barrier (Meisadona 2015).

Meningitis is characterized by initial symptoms such as sudden onset of fever or fever, lethargy, vomiting, convulsions and in more advanced cases can cause loss of consciousness to coma. The effects of meningitis include increased intracranial pressure, hydrocephalus, cerebral infarction, brain abscess, and seizures (Ratniasih n.d. 2018).

Management of meningitis clients includes pharmacological and non-pharmacological therapy. Pharmacological treatment of the client with meningitis includes intravenous broad-spectrum antibiotics. This method has a killing effect and inhibits by penetrating the cerebrospinal fluid (CSS). The empirical antibiotics commonly used in the treatment of meningitis are third-generation cephalosporins, namely cefotaxime and ceftriaxone, and carbapenems.

Whereas non-pharmacological therapy is carried out by careful monitoring of vital signs because breathing is usually a Cheyne-Stokes pattern, giving intravenous fluids according to indications, lowering body temperature with warm compresses, administering oxygen, and positioning the head up 30o to improve oxygen circulation to the brain so that help raise awareness (Rossetyowati et al., 2021). The 30o head-up position technique or lying with the head 30 degrees is a simple and effective non-pharmacological therapy for increasing oxygen to the brain, increasing awareness and increasing cerebral tissue perfusion in patients with meningitis (Wahidin, Ngabdi Supraptini, 2020).

Based on the explanation above, the authors are interested in conducting an intervention case study applying the 30o head up position technique to increase awareness of An. S who experienced Meningitis with a nursing diagnosis of ineffective cerebral tissue perfusion in the Melati Room BLUD RSU Banjar City.

## **Objective**

The purpose of this case study is to gain direct experience in providing nursing care to children with meningitis with ineffective cerebral tissue perfusion problems.

## **Methods**

This study uses a case study design. Case study is a paradigm that emphasizes exploring the "system" (bounded system) in a case in detail, accompanied by in-depth data mining

involving various sources of contextual information. This design is a detailed qualitative research model of certain individuals or social units over a certain period of time (Kusmarni, 2012).

This case study aims to explore the effect of a 30° head up position on ineffective cerebral tissue perfusion in children with meningitis. The research was conducted in the Melati Room BLUD RSU Banjar City for 4 days from 25-30 May 2022. The participants in this study were An's clients. S Age 5 Months, Female, complaining of seizures and loss of consciousness. The process of assessing and establishing a diagnosis is focused on the main problem. Objective and subjective data become a reference for evaluation of nursing implementation on a regular basis.

**Result and Discussion**

**Assessment**

Client is An. S is 5 months old from Sumanding Wetan Hamlet, Mekarsari Village, Kec. Banjar City of Banjar came to the BLUD RSU Banjar City to be precise in the Melati room on May 21, 2022 at 15.00 WIB via the emergency room with complaints of 2 seizures with a duration of ± 20 minutes in 2 days before entering the hospital accompanied by fever.

During the assessment on May 25, 2022 at 08.00 WIB client was treated with a medical diagnosis of Meningitis with complaints the client's mother said her child had seizures at night for 2 x duration ± 10 minutes with a stiff body, eyeball position up, the client is pale, looks weak and has decreased GCS awareness: 13, TTV: Pulse 135x/minute, RR: 40x/minute, Temperature: 38.2° C. The client's mother said the client had never been treated before and no family had the same disease as An. S.

**Diagnosis**

The nursing diagnoses were taken based on the results of the Data Analysis adjusted for the grouping of nursing diagnoses by the Indonesian National Nurses Association in the Indonesian Nursing Diagnostics Standards edition 1 print III revision in 2018.

Table 1. Nursing Diagnosis

Data Analysis	Ethiology	Diagnosis	Page
<p><b>Subjectives:</b> The client's mother said that the client had seizures at night with a duration of ± 20 minutes with a stiff body, the position of the eyeballs was up.</p> <p><b>Objectives:</b> Client looks weak and decreased consciousness GCS 13 Temperature : 38.2°C Pulse : 135 x/minute Respiration: 40 x/minute</p>	<p>Meningitis</p> <p>↓</p> <p>Adrenal Damage</p> <p>↓</p> <p>Vascular collapse</p> <p>↓</p> <p>Hyperfusion</p> <p>↓</p> <p>Oxygen drop</p> <p>↓</p> <p>Decreased oxygen</p> <p>↓</p> <p><b>Ineffective of cerebral tissue perfusion</b></p>	<p>Ineffective of cerebral tissue perfusion related to seizures (D.0017)</p>	<p>49</p>

## Intervention, Implementation, and Evaluation

Interventions need to be determined to reduce and prevent nursing problems in clients with ineffective cerebral tissue perfusion related to seizures referring to Nursing Intervention Standard in Indonesia, namely as follows:

Table 2. Nursing Intervention

Diagnosis	Intervention	Page
Ineffective cerebral tissue perfusion (D.0017) related to seizures.	1. Monitor the occurrence of recurrent seizures	49
	2. Monitor the characteristics of seizures	
	3. Monitor signs and symptoms of ICP	
	4. Monitor vital signs	
	5. Lay the client so as not to fall	
	6. Administer oxygen	
	7. Give a 30° Head Up Position	
	8. Collaborative drug administration	

After carrying out the nursing care process on An. S aged 5 months with Meningitis with cerebral tissue perfusion problems in the Melati Ward RSU Banjar City on May 25 2022, using the nursing process which includes assessment, diagnosis, intervention, implementation and evaluation of nursing. The author obtains some differences between the theory and the case studies that have been carried out.

These data will be a reference for solving problems and then will be enforced into nursing diagnoses. Based on a study on May 25 2022 at 08.00 the author found subjective data from the client's mother saying An. S had a seizure with a stiff body, the position of the eyeballs looking up, the client was pale and had a high fever. The client's objective data looks weak, awareness GCS 13 apathy, pulse 135 x/minute Temperature 38.2° C Respiration 40x/minute stiff (+) and brudzinky (+). The main diagnosis that appears in An. S, namely ineffective cerebral tissue perfusion (D.0017) associated with seizures.

The intervention that the author provides is based on the main complaint or problem experienced by the client. The intervention is given in accordance with the book (SIKI) published by PPNI in 2018, which includes monitoring for signs of rational seizures to monitor the risk of recurrent seizures. Monitor rational TTV to monitor the development of the condition. client, Lay the client so that he does not fall rationally so that there is no risk of injury, Give rational oxygen to maximize oxygen supply when ventilation decreases, Give a rational 30° head up position to maximize oxygen entry to the brain, Collaboration of rational drug delivery as a therapeutic treatment in healing.

Implementation of nursing in An. S with cerebral tissue perfusion associated with seizures. The implementation that was carried out was Observation of vital signs Result: TTV Temperature 38.2° C, Pulse 135 x/minute Respiration 40 x/minute, Monitor for signs of seizures Result: there is a risk factor for seizures namely fever, Advise Client to bed rest Result: Client's mother understanding and cooperative, giving a head up position of 30°. Results: the client looks comfortable, increased cerebral perfusion, Collaboration Drug delivery. Results: Neuropenamide 3x300 mg IV, Dexametasone 3x1/2 mg IV.

## Conclusion

According to the limitation problem in An. S, who had meningitis with cerebral tissue perfusion problems, was given technical intervention in the head-up position of 30°, which was

very effective and well resolved according to plan, marked by an increase in consciousness from GCS 13 to 15, namely composmentis and no recurrent seizures.

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