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Nursing intervention of Head Up 30° position to reduce intracranial pressure in ICH patients in the Nusa Indah room of Dr. Doris Sylvanus Hospital Palangka Raya

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ABSTRACT

Intracerebral Hemorrhage (ICH) is a medical emergency characterized by bleeding in the brain tissue, which can increase intracranial pressure (ICP) and risk causing death or severe neurological disability. One non-invasive nursing intervention to reduce ICP is the position of the head-up 30° which can increase blood flow to the brain thereby contributing to changes in Mean Arterial Pressure (MAP) and oxygen saturation (SpO2). This study aims to determine the effectiveness of implementing the 30° head-up position intervention to reduce MAP and increase SpO2 in hemorrhagic stroke patients with ICH. This research design is an application of Evidence Based Nursing Practice (EBNP) using a case study approach. The number of patients is 2 people according to the main EBNP journal. The intervention given is a 30° head-up position carried out in the morning and afternoon for 30 minutes each for 3 days. MAP and SpO2 measurements were carried out before and after the 30° head-up intervention for 3 days. The results of the 30° head-up intervention showed an average decrease in MAP in both patients of around 11–12 mmHg and an increase in SpO2 of around 1.5–2.5%. This indicates that the nursing intervention of 30° head-up positioning is proven to be effective in helping to reduce intracranial pressure in hemorrhagic stroke patients with ICH. The results of the application of this EBNP have limitations due to the limited number of patients implemented, the short time of implementation of the intervention and consideration of other factors that influence.

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1. Introduction

Stroke is a sudden brain dysfunction due to disruption of blood flow to the brain, either in the form of blockage or bleeding. According to the World Health Organization (WHO), stroke is a neurological condition that lasts more than 24 hours or ends in death, with no other cause than vascular disorders. The World Stroke Organization (WSO) notes that each year there are around 13.7 million new cases of stroke globally, and stroke causes around 1.9 million brain cells to die every minute during an attack. This makes stroke the leading cause of disability and the second leading cause of death in the world (WSO, 2022).

In Indonesia, stroke is one of the catastrophic diseases with a significant health and economic burden. Based on data from the Indonesian Health Survey (2023), the prevalence of stroke reached 8.3 per 1,000 population, with a mortality rate of 18.5% and a contribution to disability of 11.2% (Grid Health, 2023). In terms of financing, stroke is ranked third after heart disease and cancer, this shows that stroke not only impacts individuals, but also puts great pressure on the health care system.

Hemorrhagic stroke is a form of stroke that causes Intracerebral Hemorrhage (ICH), which is spontaneous bleeding in the brain tissue without trauma (Familah Aulyra et al., 2024). Intracerebral Hemorrhage (ICH) is estimated to affect around 1 million people worldwide each year and has a high mortality rate. Intracerebral Hemorrhage (ICH) that occurs can trigger cerebral edema, brain tissue damage, and increased intracranial pressure (ICP), which can ultimately worsen the patient's neurological condition (Syaripudin et al., 2024).

Increased intracranial pressure (ICP) is a critical issue that must be addressed immediately in ICH patients. If left uncontrolled, high ICP can disrupt cerebral blood flow and lead to secondary cerebral ischemia (Yetmiliana, 2023). One recommended nursing intervention to reduce ICP is to position the patient in a 30° head-up position. This position has been shown to increase venous blood flow from the brain and accelerate cerebrospinal fluid (CSF) absorption, thereby helping to reduce ICP physiologically and non-invasively non-invasif (Baharuddin Siregar, 2023). Research conducted by (Widhi Pawestri et al., 2019) also showed that the 30° head position was effective in reducing Mean Arterial Pressure (MAP) and ICP without significantly reducing Cerebral Perfusion Pressure (CPP). Meanwhile, (Muñoz-Venturelli et al., 2015) also found that the 30° head-up position was able to increase oxygen saturation from 97.07% to 98.33% in stroke patients. This intervention is considered safe, easy to perform, and is part of the standard of care for patients at risk of increased ICP.

At Dr. Doris Sylvanus Regional Hospital in Palangka Raya, data from November 1, 2024, to January 31, 2025, showed 41 cases of ICH (ICD I61) and 66 cases of cerebral infarction (ICD I63). Most ICH patients were male (28 cases) and aged over 50 years (42 cases), indicating that the elderly are a high-risk group. Considering the high number of cases and the risk of complications due to increased ICP, researchers were interested in determining the effectiveness of the 30° head-up position intervention to increase oxygen saturation and reduce Mean Arterial Pressure (MAP) in helping to reduce ICP.

2. Methods

This study is an application of Evidence-Based Nursing Practice (EBNP) using a case study approach to determine the effectiveness of the 30° head-up position in reducing intracranial pressure (ICP) in hemorrhagic stroke patients diagnosed with Intracerebral Hemorrhage (ICH) with indicators of decreased Mean Arterial Pressure (MAP) and increased oxygen saturation (SpO2). The population in the application of EBNP based on the case study was all hemorrhagic stroke patients with ICH treated in the Nusa Indah Ward of Dr. Doris Sylvanus Hospital, Palangka Raya. The sampling technique used purposive sampling based on inclusion and exclusion criteria based on the main EBNP journal. Data were collected through vital sign observation sheets, Mean Arterial Pressure (MAP) measurements, and oxygen saturation (SpO_2) before and after the 30° head-up position intervention. The intervention provided, namely the 30° head-up position, was carried out in the morning and afternoon for 30 minutes each for 3 days. The 30° head-up position intervention was in accordance with the SOP of Dr. Doris Sylvanus Hospital. Doris Sylvanuas Palangka Raya in hemorrhagic stroke (ICH) patients using a bed with a head elevation adjuster (bed adjustable), as well as an inclinometer installed on the patient's bed to ensure the head elevation angle is exactly at 30°. MAP and oxygen saturation measurements were carried out before and after the 30 0 head up intervention for 3 days using tools available at Dr. Doris Sylvanus Palangka Raya Regional Hospital. The results of MAP and oxygen saturation were recorded on the observation sheet before and after the intervention.

3. Results and Discussion

Results

The intervention of providing a 30° Head-up position to two patients according to the criteria in the implementation of EBNP who were being treated in the Nusa Indah Ward of Dr. Doris Sylvanus Regional Hospital, Palangkaraya. Both patients had been diagnosed with hemorrhagic stroke experiencing ICH with clinical symptoms of decreased consciousness and increased intracranial pressure.

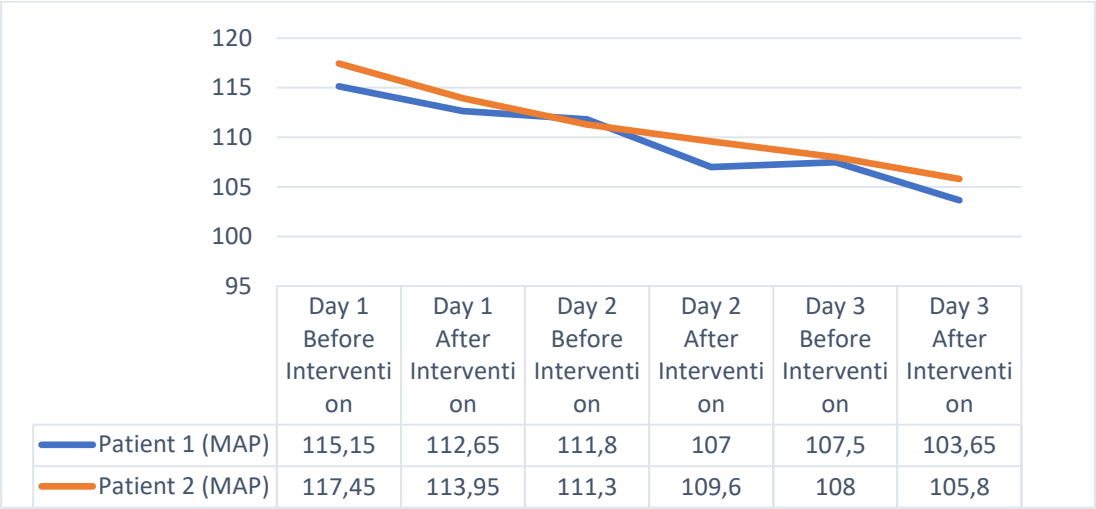

Figure 1. Mean Arterial Pressure (MAP) Results Before and After 30° Head Up Position Intervention

Based on graph 1, it shows that in patient 1, the MAP value before the intervention of giving the Head up 300 position on the first day was 115.15 mm Hg and became 103.65 mm Hg after the intervention on the third day. Meanwhile, in patient 2, it shows that the MAP value before the intervention of giving the Head up 300 position on the first day was 117.45 mm Hg and became 105.8 mm Hg after the intervention on the third day. The average decrease in MAP in both patients was around 11–12 mmHg. The results of the graphs of the two patients above both patients showed a gradual decrease in MAP from day to day and the decrease in MAP occurred consistently after the intervention on each day, this shows that the Head up 300 position intervention significantly reduced MAP in hemorrhagic stroke patients with ICH.

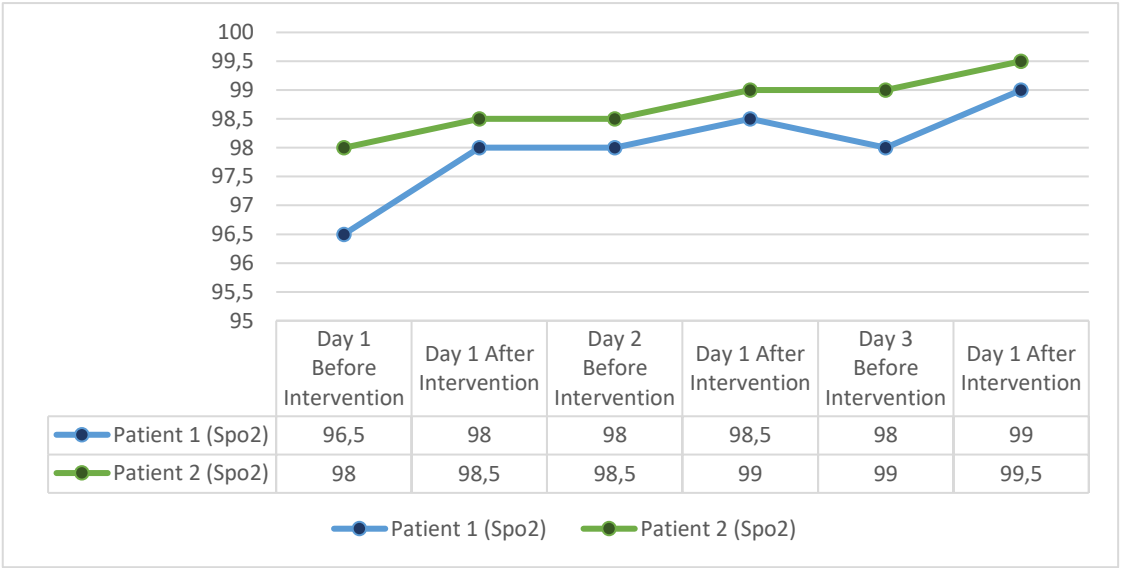

Figure 2. Oxygen Saturation (SpO2) Results Before and After 30° Head Up Position Intervention

Based on graph 2, it shows that in patient 1, the oxygen saturation value before the intervention of giving the Head up position 300 on the first day was 96.5% and increased to 99% after the intervention on the third day. Meanwhile, in patient 2, it shows that the oxygen saturation value before the intervention of giving the Head up position 300 on the first day was 98% and increased to 99.5% after the intervention on the third day. The average increase in SpO_2 in both patients was around 1.5–2.5%. The results of the graph also show a tendency for increased oxygen saturation in stroke patients with ICH after being given the Head up position 300 intervention.

Discussion

Based on the results of the implementation of the 30° head up position intervention in hemorrhagic stroke patients with ICH in two patients in the Nusa Indah Room of Dr. Doris Sylvanus Palangka Raya Regional Hospital, it showed a decrease in intracranial pressure with indicators of a decrease in MAP and an increase in oxygen saturation. The implementation of the 30 0 head up position intervention carried out consistently for three days was able to provide a positive and effective impact in reducing MAP values and increasing oxygen saturation in the two patients. Research from (Rahayu & Mustikarani, 2023) shows that setting the head up position at 300 can increase oxygen saturation in ICH patients because it helps blood flow to the brain and maximizes cerebral tissue oxygenation and research. In addition, research from (Trisila et al., 2022) showed that a 30-degree head-up position significantly increased oxygen saturation in stroke patients. Research by (Widhi Pawestri et al., 2019) dan (Purwanti Ariani et al., 2024) states that the head-up position can affect changes in Mean Arterial Pressure (MAP) by reducing jugular venous pressure and reducing intracranial pressure (ICP), thereby increasing perfusion to the brain and maintaining MAP stability. Research by (Wahyudin et al., 2024) dan (Ekacahyaningtyas et al., 2017) shows that applying the 30° head-up position to ischemic and hemorrhagic stroke patients significantly increases oxygen saturation. Furthermore, another study by (Restu Santama et al., 2025) observed two non-hemorrhagic stroke patients who experienced increased oxygen saturation after three days of 30° head-up positioning, with an average daily increase of 1.67%. The decrease in MAP and increase in oxygen saturation are clinically significant, reflecting the potential reduction in intracranial pressure (ICP) after the 30° head-up position intervention.

Based on the above description, the implementation of the 30° head-up position intervention strengthens scientific evidence and is effective in increasing oxygen saturation and reducing MAP in hemorrhagic stroke patients with ICH and has become a clinical nursing procedure in managing hemorrhagic stroke patients with ICH.

4. Conclusion

Based on the results of the application of EBNP through this case study, it was concluded that the nursing intervention of 30° head-up positioning was proven effective in helping to reduce intracranial pressure as indicated by a decrease in Mean Arterial Pressure (MAP) and an increase in oxygen saturation (SpO_2), in addition it will also strengthen the 30° head-up positioning intervention as one of the nursing actions based on scientific evidence to handle increased intracranial pressure in hemorrhagic stroke patients with ICH effectively and safely. However, the results of the application of EBNP have limitations because it was implemented in a limited number of patients, the short time of implementation of the intervention and consideration of other influencing factors so that it requires further application by other researchers.

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