



# Literature Review: Effect of 30° Head Up Position Intervention on Increased Cerebral Tissue Perfusion in Hemorrhagic Stroke Patients

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**Abstract.** Stroke is a neurological deficit that has a sudden onset, lasts more than 24 hours and is caused by cerebrovascular disease. Stroke or cerebrovascular injury is a condition in which the brain loses function due to cessation / reduced blood supply. The description of the amount of oxygen content contained in the blood to meet the needs of tissues is seen through oxygen saturation. The Head up position is a flat position with the head 30° higher with the body position in parallel. The purpose of writing this literature review was to determine the effect of 30° head up position intervention on increasing cerebral tissue perfusion in hemorrhagic stroke patients. The writing method used is the literature review method, which is collecting data and analyzing articles and journals. The subjects in this review literature were stroke patients who were given a head elevation position of 30° to improve cerebral tissue perfusion. The result of the literature review is the effect of giving a 30° head elevation position on increasing tissue perfusion in stroke patients, namely increased saturation. Oxygen saturation may increase but varies for each study conducted, which means one way to improve tissue perfusion is to position the head elevation to 30°.

**Keywords:** Hemorrhagic Stroke, Cerebral Perfusion Disorder, 30° Head Up Position

## 1 Introduction

Stroke is a cerebrovascular disease that causes many disabilities and deaths in the world [1]. Impaired nerve function in stroke is caused by impaired blood flow in the brain which can cause neurological disorders manifested in the form of paralysis of the muscles of the extremities, weakness of the swallowing muscles, weakness in verbal communication, visual impairment, impaired consciousness can even cause death [2] [3].

WHO states that stroke is the cause of 6.7 million deaths each year worldwide [4]. Stroke causes 6 deaths every 60 seconds and in every 60 seconds there can be 30 new incidences of stroke worldwide [5]. The prevalence of stroke in Indonesia based on the diagnosis of health workers is 7.0 per mile and that based on the diagnosis of health workers or symptoms is 12.1 per mile [6]. So, as many as 57.9 percent of stroke has

been diagnosed by health workers [7]. The Stroke Association in Europe shows that the probability of recurrent stroke is 3.1% in 30 days, 11.1% in 1 year, 2.4% in 5 years, and 39.2% - 40% will recur in 10 years [8]. In epidemiological research conducted by the University of Indonesia, it was found that 19.9% of stroke events were recurrent strokes [3]. Blood flow that is not smooth in stroke patients results in impaired oxygen supply so it needs to be monitored and handled appropriately [9]. Oxygen saturation is a picture of oxygen adequacy in the body that aims to determine the right therapy [10]. Giving a 30° head up position in stroke patients can improve hemodynamic status by facilitating increased cerebral blood flow and maximizing cerebral tissue oxygenation [11][12][3].

Information about things that can be the cause of re-stroke attacks is needed by the community, especially stroke patients who undergo treatment at home, as well as caregivers who provide care to stroke patients [13][14]. Reducing the incidence of recurrent strokes, preventing disability, and reducing mortality are the goals of recurrent stroke prevention [15][16]. Prevention of recurrent stroke can be divided into several things, including pharmacological, non-pharmacological, psychological, comorbidity control and others [17]. Health workers have a responsibility in providing information to patients and families about the causes and how to prevent recurrent strokes [18][19].

## **2 Research Method**

This research design uses a literature study method or literature review that focuses on the results of journal writing related to the topic or writing variable. The journals selected in this study already meet the criteria to be used as material in this study. The selected journals are journals published for the last 6 years from 2015 to 2021. The keywords used in searching journals are recurrent stroke, post stroke, skunder stroke, stroke recurrence. The data that has been obtained will be processed and presented in the form of tabulations.

## **3 Result and Discussion**

The research journals obtained as many as 20 journals, carried out in-depth analysis. The results of the analysis will be discussed to find conclusions in accordance with the objectives of the research conducted.

Stroke is a disorder of local and extensive brain function that occurs suddenly, lasting more than 24 hours, can cause death without any other cause than vascular [20][21]. Stroke is caused by disruption of the brain's blood supply, usually due to rupture of blood vessels or blockage. Usually in stroke patients there is lumen occlusion (narrowing of blood vessels) caused by several factors, including atherosclerosis because there is a narrowing of blood vessels, blood flow to the tissues will decrease. This can cause an imbalance of fluid in the brain and oxygen supply to the brain decreases, causing the brain to lack oxygen and experience hypoxia, if this complication is not treated immediately it will experience ischemic brain and even death [22][23][24]. For this reason,

it is necessary to observe the percentage of oxygen (oxygen saturation) of patients after a stroke attack to prevent the severity of stroke [25][26].

Based on the results of the literature review of the 10 journals, it was found that the position of head up 30° has an effect on increasing cerebral tissue perfusion of hemorrhagic stroke patients characterized by increased oxygen saturation [27][28][29]. Head purpose Up 30° i.e. To maximize oxygenation of brain tissue, a higher head position can facilitate increased blood flow to the cerebral and maximize cerebral tissue oxygenation [30][31][32].

Head up positioning 30° is an independent nursing action, which can increase oxygen saturation in stroke patients [33][34][35]. The position of the head up 30 degrees affects the venous return to the maximum so that blood flow to the cerebral becomes smooth, increases the metabolism of cerebral tissue and maximizes oxygenation of brain tissue, so that the brain can work according to its function [36][37][38]. Stroke patients must receive fast and appropriate treatment to minimize the severity of stroke and the risk of disability [39][40][41]. Poor blood flow can result in hemodynamic disorders including oxygen saturation [42][12][43].

Indications for the provision of head elevation 30° Caused by the occurrence of increased intracranial pressure characterized by headaches due to trauma to part of the brain, increased blood pressure, nausea, vomiting, changes in behavior. Head elevation 30° will increase the flow of the jugular vein that is not valved so that it can reduce venous blood volume which decreases the volume of central venous blood which can reduce intracranial pressure so that headaches, increased blood pressure, nausea, vomiting, and behavioral changes can be resolved [44][45][46]. Theoretically, the supine position accompanied by the head up shows the backflow of blood from the inferior part to the right atrium is quite good because the vascular resistance and pressure of the right atrium are not too high, so the volume of blood entering (venous return) to the right atrium is quite good and the pressure of filling the right ventricle (preload) increases, which can lead to an increase in stroke volume and cardiac output. The patient is positioned head up 30° will increase blood flow in the brain and maximize oxygenation of cerebral tissue [47][48]. Head up 30 degrees that are done continuously will get good results, this is proven by patients who often intervene head up 30 degrees experience a fast recovery, in addition to proper treatment of stroke in adolescents. Treatment of stroke in adolescents must be precise and fast so that the achievements to be achieved can be exceeded properly. Symptoms that are not clearly visible by health workers make health workers more careful with the symptoms that will appear so that they can inhibit brain tissue damage and reduce the effects of disability in post-stroke patients. Activity is passive joint movement exercises every 25 to 30 minutes. Both actions aim to improve cerebral hemodynamics which ultimately improves the treatment outcomes of stroke patients [26][49][50].

## 4 Conclusion

The results of this study can be concluded that giving a head elevation of 30° in stroke patients affects oxygen saturation in these patients, where this action can maintain the

stability of the function of organ work to remain smooth, especially the respiratory system and early regulation system that can work optimally and provide comfort for stroke patients. This research can be applied as a nursing intervention in stroke patients because it has the benefit of increasing oxygen saturation. So it is expected that the hospital can compile Standard Operating Procedures regarding the provision of Head Up 30° positions for stroke patients.

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