The Effect of Acupressure on Glasgow Coma Scale in Ischemic Stroke Patients in Goeteng Taroenadibrata Purbalingga Hospital Central Java-Indonesia

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Abstract— Background: Impairment of consciousness in stroke that is measured objectively by Glasgow Coma Scale is one of prognosis determinants and severity indicators. Several studies have shown that acupressure can provide neuroprotective effect for brain’s cells. This study aims to identify the effect of acupressure on the value of GCS in stroke patients. Methods. The type of this study was quasi experimental. The number of samples was 25 respondents (11 intervention and 14 control). The intervention group got standard therapy and acupressure in 3 days. The control group only got standard therapy. GCS assessment was conducted on the first and last day. The differences of GCS value were analyzed with the Wilcoxon & Mann Whitney test. Results. There were significant differences in value GCS before and after treatment in the intervention group (p-value = 0.028), but not in the control group (p-value=0.243). Mann Whitney test showed that the average increase in value GCS of intervention group was higher than the control group (p-value=0.02). The effect of acupressure on the GCS value was shown through the inhibition of the side effects of standard therapy and variety of neuroprotective mechanism of the acupressure therapy itself. Conclusion. Stimulation of acupressure point’s can increase GCS value in stroke patients

Keywords: acupressure; stroke; GCS

I. INTRODUCTION

The decrease of consciousness in stroke’s patients that marked by a lower of GCS value indicates a critical situation that needs more intention. In this situation, there is brain dysfunction including either hemisphere or inner part of brain especially Reticular Activating System (RAS). The airways closed and aspirations are threat for patients whose decrease of consciousness [1].

Pharmacological therapy for prevent and improve brain cell damage have a side effect that can decrease therapeutic affect from the medicine, like insomnia, anxiety, agitation, fatigue, gastrointestinal track problem, etc. Thus, non-pharmacologic therapy as a complementary therapy for effective pharmacological therapy without side effects is needed [2].

Neuroprotective effects of acupressure in several studies provide beneficial effects in protecting and preventing cell damage caused by ischemia. Research Hernandez et al showed that the group of head injuries patients who received acupressure has memory enhancement function better than the control group [3]. This is associated with the role of endorphins, which stimulated in protecting brain cells. Research conducted by reference [4] was the head injury patients who received acupressure therapy combined with standard therapies have increased the value of GCS higher than patients who only receive standard therapy [4]. Various other evidence base regarding acupressure, indicates that this action is one of the non-pharmacologic therapies are proven to provide many benefits to the recovery of stroke patients [3], [5], [6], [7].

II. METHOD

The study design used was Quasi Experimental Design approach Pretest-Posttest Control Group Design. In the study, sample was divided into two groups: the control group and the treatment group. The control group was the only group getting standard medical therapy, whereas the treatment group, in addition to medical therapy also gets acupressure therapy.

Population of this study was all ischemic stroke patients who receive care at the Hospital Dr Goeteng Taroenadibrata Purbalingga, Central Java, Indonesia. Treatments are stimulation at two points Acupressure (Neiguan and Zusanli) for 5 minutes on each point. Stimulation method used is rotating massage at the points of acupressure. Stimulation of acupressure points was given daily for 3 days. The level of consciousness was measured using the Glasgow Coma Scale (GCS) before and after treatment (day 1 and day 3). The number of samples in this study was 25 respondents who were divided into two groups, namely the control group (14 respondents) and treatment group (11 respondents).

To know the differences in the level of consciousness before and after the intervention Wilcoxon test was used.
While to know the difference consciousness rising in the treatment group and the control group using the Mann Whitney test.

III. RESULT

A. Respondent Characteristics

Characteristics of respondents in this study are in Table 1

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Intervention group</th>
<th>Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Year)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>46-55</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>56-65</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>66-75</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>&gt; 75</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Female</td>
<td>7</td>
<td>9</td>
</tr>
</tbody>
</table>

Table 1 shows that the variables of age and gender in the treatment group and the control group there were no significant differences. Thus both groups of respondents are homogeneous.

B. The difference in value GCs in the intervention group and the control group

<table>
<thead>
<tr>
<th>Group</th>
<th>Pre Mean</th>
<th>Pre SD</th>
<th>Post Mean</th>
<th>Post SD</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention</td>
<td>10.18</td>
<td>1.168</td>
<td>12.18</td>
<td>2.892</td>
<td>0.028</td>
</tr>
<tr>
<td>Control</td>
<td>10.71</td>
<td>1.267</td>
<td>9.71</td>
<td>2.92</td>
<td>0.024</td>
</tr>
</tbody>
</table>

Table 2 shows that there are significant differences in the mean GCs before and after treatment in the treatment group (p=0.028), while the control group showed no significant difference (p = 0.243).

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean Increasing</th>
<th>SD</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention</td>
<td>2.00</td>
<td>2.408</td>
<td>0.020</td>
</tr>
<tr>
<td>Control</td>
<td>-1.00</td>
<td>2.855</td>
<td></td>
</tr>
</tbody>
</table>

According to the table 3 it is known that in the treatment group had a mean increase greater consciousness than in the control group. This indicates that the stimulation of acupressure points can increase the value of GCS of ischemic stroke patients. This indicates that the stimulation of acupressure points can increase the value of GCS of ischemic stroke patients.

IV. DISCUSSION

The high increase in the average value of GCS in the treatment group, apart from the neuroprotective effects of standard therapy, is also supported by the neuroprotective effect of acupressure therapy itself. Acupressure also enhances the neuroprotective effects of standard drugs with lower side effects such as anxiety, insomnia, agitation, and gastrointestinal disorders [3], [8].

Besides a role in maximizing the therapeutic effect of standard therapy with minimal side effects, acupressure itself has some neuroprotective mechanism that may help preserve brain cells from damage caused by ischemia. Ischemic conditions in ischemic stroke is caused by decreased blood flow in the brain 20cc/100 grams / minute due to thrombus or spasm of the blood vessels. In this condition, although the brain cells are still alive, he has lost function. So if it happens to hemispher cerebral cortex, area of ascendend reticular activating system (ARAS), or other consciousness raiser of the brain, it will be followed by impairment of consciousness [1], [11].

Stimulation of acupressure points will increase the signal in certain areas of the brain. Another studies showed that stimulation of the point ST 36 (Zusanli) consistently able to enhance brain signals in the limbic system and subcortical areas, among others: the anterior cingulate cortex, parahippocampus, hypothalamus, periaqueductal gray, secondary somatosensory cortex (SII), secondary somatosensory cortex (SI), parietal lobes, motors are supplementary (SMA), and temporal cortex and frontal. While the PC 6 point stimulation shown to increase the signal especially in the amygdala and insula, SII, SI, and the premotor cortex. Increased signal in the area of the brain can improve perfusion to the area through increased regional cerebral blood flow (rCBF). Acetylcholine nicotinic receptor activation as the effects of stimulation of acupressure at the point ST 36 and PC 6 is believed to improve regional perfusion [8].

Another neuroprotective effects of acupressure is inhibition of glutamate expenditure. Spending glutamate was triggered by changes in capillary permeability due to ischemic conditions. Glutamate spending will trigger the entry of Ca into the intracellular that activates proteolytic enzymes. Activation of these enzymes will lead to intra-and extracellular degradation of organs, which in turn was followed by cell death. Stimulation of acupressure point can inhibit hyperemia and glutamate expenses, so as to prevent damage to nerve cells caused by ischemia, so it can avoid damage of nerve cells caused by ischemia [9].

Thus, the contribution of acupressure in improving the value of GCS in stroke patients, as well as by optimizing the therapeutic effects of standard therapies via inhibition of side effects and some of the neuroprotective mechanisms. Neuroprotective Effects of acupressure therapy than with preventing cerebral edema also through the mechanism of protection of brain cells from ischemic conditions. The recovery the integrity and interaction between cells raiser consciousness (ARAS, hemispher cerebral cortex, thalamus, hypothalamus, and mecencefalon) will be followed by the
recovery of the patient’s consciousness shown by an increase in value of GCS [7], [10], [12]

Repair of brain cells in the area hemisphere or inner part of brain especially reticular activating system (RAS) will be followed by an increase in the awareness that the value of GCS also increased [8], [10].

Acupressure is part of the complementary therapies that are proven beneficial in the recovery of stroke patients. In addition to providing stimulus to the RAS system and brain cortical areas, it also has a variety of neuroprotective mechanisms that prevent brain cell damage caused by ischemia. Therefore, acupressure can be used as an alternative nursing interventions in order to improve the recovery of stroke patients are characterized by the increase in value GCS [7], [8], [9].

V. CONCLUSION AND PROPOSITION

Stimulation of acupressure points have positive effects in improving the value of GCS in ischemic stroke patient with consciousness derivation. For health care institutions, it is suggested to consider the use stimulation of acupressure point as a standart intervention for ischemic stroke patient with consciousness derivation.

REFERENCES