A Comparative Study OF NIHSS between Ischemic Stroke Patients with and without Risk Factors

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ABSTRACT: Stroke is the third common reason of death in worldwide. Utility of the national Institutes of health stroke scale as a predictor of care disposition among stroke patients on admission could reduce the costly process, rehabilitation and unnecessary length of stay at hospital and with regard to the impact of cerebrovascular accident risk factors in developing atherosclerosis; we decided to do this study. In this study 100 patients with ischemic stroke were evaluated who their average age was 65.83±15.32 years and also 54.54% were men and 45% were women. 25% of patients were with no stroke risk factors and 45% were with one risk factor. 50% had hypertension, 13% diabetes, 18% hyperlipidemia, 14% a recent MI history and 31% had smoking history. NIHSS average among patients was 6.59±4.33 and majority of patients were in minor range. NIHSS level were evaluated with gender (p=0.058), age (p=0.876), HTN (P=0.070), HLP (P=0.103), DM (P=0.999), and history of MI (P=0.262) and history of CVA (P=0.964) and also NIHSS level with smoking (P=0.109). We concluded that multiple vascular risk factors is not compatible with the severity of clinical symptoms and worsening of neurological symptoms based on NIHSS score in patients with CVA. It shows that CVA with high NIHSS score could possibly occur even in patients without vascular risk factors due to absence of collateral vessels in the brain and not response of brain hemodynamic. Hence it is necessary to consider CVA as a diagnostic and therapeutic priority in patients without vascular risk factors.

Key words: Cerebrovascular accident, Risk factors

INTRODUCTION

Stroke is the third common cause of death and also the leading cause of long-term disability worldwide (Ali et al., 2013). Atherosclerotic plaque rupture causes thrombus formation which finally can lead to heart attacks and strokes (Atanassova et al., 2007). Atherosclerosis is the most important underlying causes of ischemic cerebrovascular accident (CVA). CVA risk factors include hypertension (HTN), hyperlipidemia (HLP), diabetes mellitus (DM) and smoking (Daroff et al., 2012; Davies, 1995). Management of these patients is important; hence national Institutes of health stroke scale (NIHSS) was designed to measure acute CVA severity. It is composed of 11 items such as level of consciousness, horizontal eye movement, visual field test, facial palsy, motor arm, motor leg, limb ataxia, sensory, language, speech, extinction and inattention (Fischer et al., 2005). Utility of the NIHSS as a predictor of care disposition among stroke patients on admission could reduce the costly process and time-consuming hospitalization, rehabilitation and unnecessary length of stay at hospital (6) and with regard to the impact of CVA risk factors in developing atherosclerosis, (Atanassova et al., 2007) we decided to research about any relationship between acute CVA severity and CVA risk factors, perhaps will be found any way to decrease mortality, costs of hospitalization, consequences of disability and death.

MATERIALS AND METHODS

This cross-sectional study was performed on patients with focal ischemic neurologic lesions who referred to neurology department of Alavi hospital in Ardebil. Brain computed tomography (Brain CT) or
magnetic resonance imaging (Brain MRI) was performed for patients to rule out hemorrhage. After proving ischemic cerebrovascular damage, 100 patients were enrolled in this study. The patients information was formed as a check list consisted of demographic information, diabetes history, hypertension, smoking and etc. also NIHSS score was investigated and NIHSS level was classified based on NIHSS scoring as follows: without stroke symptoms: 0 /1-4= Minor / 5-15= Moderate stroke/ 16-20=Mod to Severe/ 21-42= severe stroke (Li et al., 2003) Data was calculated and entered on SPSS software, version 16 and analyzed with Chi-Square Test and the T-Test.

RESULTS AND DISCUSSION

In this study 100 patients with ischemic stroke were evaluated. The mean age of patients was 65.83±15.32 years. Among the patients 54.54% were men and 46% were women. Twenty-five percent of patients had no stroke risk factors and 45% had at least one risk factor.

50% had hypertension, 13% diabetes, 18% hyperlipidemia, 14% a recent MI history and 31% had smoking history. Seventy-four percent of patients were with no stroke history. Also we evaluated NIHSS score on admission. The NIHSS average among patients was 6.59±4.33 and majority of patients were in minor range. The relationship between NIHSS level and patients gender were evaluated and analyzed with T-Test.

The result demonstrated the NIHSS level in male was less (P=0.058) The NIHSS level was evaluated in smoking and non smoking patients that no significant relationship was found (P=0.109).

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>HTN</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>DM</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>HLP</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Smoking</td>
<td>31</td>
<td>31</td>
</tr>
<tr>
<td>Recent MI history</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>History of CVA</td>
<td>28</td>
<td>28</td>
</tr>
</tbody>
</table>

Table 1. The frequency and percentage of vascular risk factors in our study

Also the relationship between NIHSS level and HTN, HLP, DM, history of MI and CVA was evaluated. The T-Test’s results showed that there was no significant relationship between NIHSS level and HTN (P=0.070), NIHSS level with HLP (P=0.103), NIHSS level with DM (P=0.999). Statistically significant relationship was not obtained between patients with history of MI (P=0.262) and CVA with NIHSS level (P=0.964) too. There were not also observed significant relationship between NIHSS level with number of CVA risk factors (P=0.383).

In Mazdeh study (Masoud et al., 2009), cases were with the mean age of 50 years and 56.9% were men. In Masoud study (Mazdeh et al., 2006) was observed 52.5% of patients were women, 48.75% men
and also 52.5% of all were older than 70 years. In Moini and Javad Mousavi study (Meiklejohn et al., 2001) the mean age of patients was 58.42 years and 57.7% were men. In Zongte study (Moini and Mousavi, 2008) was also observed that in cases with stroke the average age is 62.19 years, 66.66% men and 33.34% were women. In Li study (Monshi Karimi et al., 2011) the average age in cases is 60.3 years and 63.5% men. In Atanassova study (NSCT) in cases the average age of patients was 46.4 years and 75.6% were men. In study of Meiklejohn (Schlegel et al., 2003) the average age of men was 57.2 years and for women was 56.5 years and 56.6% of them were men. After evaluation of subjects in terms of age and gender in this study with similar studies, was observed that age and gender of patients was like other studies. In study of Monshi-Karimi (15) results indicated that 17.4% were with hyper lipidemia, 43.5% with hypertension, 41.3% with diabetes Miletus and 45.7% were smokers. In Li study (Monshi Karimi et al., 2011), 15.2% of cases were with previous CVA history, 63.2% with hypertension and 12.4% with diabetes history. Atanassova study (NSCT) illustrated that 48.8% of patients with CVA history were smokers. Meiklejohn study (Schlegel et al., 2003) showed the frequency of 6.6% diabetes, 50% smoking, 41.5% hypertension history, 13.2% hyperlipidemia history and 14.2% of subjects had no risk factor. Evaluation of current and other studies showed that the hypertension is one of the most prevalence of cardiovascular risk factors that this is probably due to the high prevalence of this disease in older patients. History of previous MI incidence in this study was frequent. Stöllberger study (Stöllberger et al., 2005) showed in their study that intracranial hemorrhage was more prevalent in diabetic (P = 0.0001) however, there was no relationship between mortality of patients and DM (P = 0.355) and also was stated that the increase in blood glucose in non-diabetic patients with acute stroke aggravate prognosis of patients. All study (Ver Hage, 2011) showed smoker patients had lower NIHSS and lower in-hospital mortality after stroke compared to nonsmokers. The possible etiology is assumed to be ischemic preconditioning in smokers secondary to episodic hypoxia and chronic changes in vasomotor tone and presence of small vessel cerebral collaterals leading to better cerebral perfusion. Nevertheless it should not be considered as a benefit of cigarette smoking. Because smoking doubles the risk of ischemic stroke and occurred in younger ages compared to nonsmokers based on all's study. In our study, the NIHSS level was evaluated in smoking and non smoking patients that no significant relationship was found. Schlegel study (Greenberg et al., 2012) stated that any major complication such as infection, MI, recurrent stroke and respiratory failure leading to increased level of NIHSS and also reduced level discharge of patients possibility and in Fischer study (Zongte et al., 2008) also illustrated although risk factors cannot predict the central obstruction in digital subtraction arteriography (DSA) but several scoring items of NIHSS such as consciousness, gaze, motor leg and neglect are considered as predictors components in this topic significantly. Meanwhile such a result was not observed in present study. It seems that although stroke risk factors have a role in the incidence of atherosclerosis that is one of the major underlying reasons of ischemic stroke in patients, but have not had a significant role in the severity of stroke. However further studies are recommended. Finally we concluded that multiple vascular risk factors is not compatible with the severity of clinical symptoms and worsening of neurological symptoms based on NIHSS score in patients with CVA and therefore cannot be considered as a predictor factor of CVA. It shows that CVA with high NIHSS score could possibly occur even in patients without vascular risk factors due to absence of collateral vessels in the brain and not response of brain hemodynamic. Hence it is necessary to consider brain diseases such as CVA as a diagnostic and therapeutical priority in patients without vascular risk factors.

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Conflicts of Interest Disclosure: The authors declare that there are no conflicts of interest with any financial organization.

REFERENCES


