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# LARGE VESSEL ATHEROSCLEROTIC INFARCTION AND HEADACHE

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## ABSTRACT

**Background:** Discovering the prodromal symptoms of stroke is essential for preventing the occurrence or intensification of the disease. The value of headache as a prodromal symptom for large vessel atherosclerotic infarction is unclear. This study is designed to assess the frequency of headache as a prodromal symptom of stroke, and its prognostic value in large vessel atherosclerotic infarction. **Methods:** In this cross sectional study, 225 patients suffering from supratentorial large vessel atherosclerotic infarction, as verified by brain MRI and carotid Duplex/Transcranial Doppler sonography, were assessed in a period of one year. Patients with a history of migraine or temporal arteritis, and those with a headache older than one week before the stroke were eliminated from the study. Also, patients with a background disease (except controlled hypertension, cardiac disease, and diabetes) were excluded from the study. Patients taking medications including sedatives, psychological drugs, and narcotics were excluded as well. The patients underwent laboratory evaluations (including erythrocyte sedimentation rate) and the abnormal cases were excluded. In this study, between patients with headache only those patients with a history of headache during the last week before stroke were assessed. The intensity of lesions was studied using the imaging findings, and the results were statistically analyzed using SPSS software. **Results:** 114 patients (50.6%) were males and the rest females. 36 patients (16%) complained of headache before stroke. 33 patients with headache and 21 patients without headache had extensive stroke. The difference is statistically significant ( $p < 0.001$ ).

**Conclusions:** Although headache is not a common prodromal symptom for large vessel atherosclerotic infarction, it must be considered as a warning for stroke in patients without a background disease. In cases of stroke following headache, the prognosis tends to be poorer.

## INTRODUCTION

Headache is commonly reported in stroke, but its frequency varies from study to study.<sup>1-3</sup> The occurrence of headache is different between patients with large artery disease and those with small artery disease.<sup>2-4</sup> Also there may be a relation between the localization of stroke and the type of headache<sup>3,5,6</sup> but there is some disagreement about the reliability of the correlation. Some Studies show that headache may have prognostic value in stroke patients<sup>7</sup> but value of headache as a prodromal symptom for large vessel atherosclerotic infarction is unclear. This study is the first study that evaluate the frequency of headache as a prodromal symptom of stroke, and its prognostic value in large vessel atherosclerotic infarction.

## MATERIALS AND METHODS

This study was nested in a prospective hospital-based

stroke registry of patients admitted to Ali Ebn Abitaleb hospital in Rafsanjan (south of Iran). The study was done from March 2005 to March 2006. All patients had supratentorial large vessel atherosclerotic infarction. The diagnosis is done by brain MRI and carotid Duplex/Transcranial Doppler sonography. (Neurology in Clinical Practice, 5th Edition) Patients were asked about the presence and localization of headache at one week before onset of disease. Patients with a history of migraine or temporal arteritis, and those with a headache older than one week before the stroke and no reliable patients (for example, confused patients) were eliminated from the study. Also, patients with a background disease (except controlled hypertension, cardiac disease, and diabetes) were excluded from the study. Patients taking medications including sedatives, psychological drugs, and narcotics were excluded as well. The patients underwent laboratory evaluations (including erythrocyte sedimentation rate) and the abnormal cases were excluded. Extensive stroke in our

study defined as infarction in total territory of main brain arteries. In this cross sectional study data of 225 patients with large vessel atherosclerotic infarction were investigated. Statistical analyses were carried out using SPSS software and Fisher Exact test.

## RESULTS

In this study, 114 patients (50.6%) were males and the rest females. The median age of our population was 57/5 years (range 49 to 81) in men and 63years (range 45 to 87) in women. Of 225 patients with large vessel atherosclerotic infarction 36 (16%) experienced headache one week before stroke onset. (Table 1)

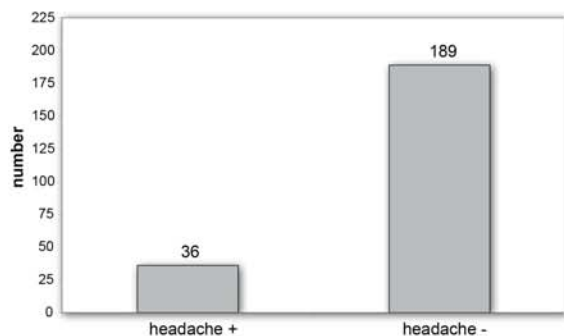


Table 1: Frequency of headache in all patients

Statistical analysis (Table 2) showed that patients with a positive history of headache had extensive lesion in neuroimaging more than in the other group. The difference is statistically significant ( $p < 0.001$ ). The other relations between headache and other parameters remained essentially unchanged in this analysis.

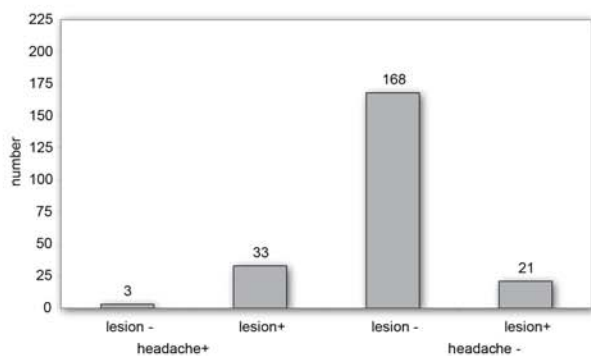


Table 2: Frequency of extensive lesion in both groups

## DISCUSSION

Headache is a common symptom in acute ischemic and hemorrhagic stroke, but many aspects of stroke-related headache, such as its incidence, pathophysiol

ogy, risk factors, and relation to stroke severity and outcome, are uncertain. The reported frequency of stroke-related headache ranges from 7% to 65%.<sup>3, 8-10</sup> Previous studies provide differing results as to whether lateralized headache is related to the side of the lesion, whether headache frequency is different in anterior versus posterior lesion localization, whether it is more common in women than in men or whether headache in stroke is related to several factors, such as blood pressure (BP), history of hypertension, or history of migraine.<sup>6, 11-14</sup> All form of stroke susceptible to headache but frequency in any form is different.<sup>15-18</sup> In ischemic stroke, headache was observed in 41% of thrombotic infarcts, in 39% of cardioembolic infarcts, in 23% of lacunar infarcts and in 26% of TIA. Headache was significantly more common in thrombotic than lacunar infarcts. In hemorrhagic stroke, headache was observed in all subarachnoid hemorrhages and in 58% of intraparenchymal hemorrhages.<sup>6</sup> prognostic value of headache in stroke patients is controversial.<sup>1, 7, 8</sup> Jørgensen found that stroke-related headache is not related to stroke outcome.<sup>13</sup> Arboix showed Headache is related with early neurological deterioration and associated with increased morbidity and mortality.<sup>7</sup> In this study we evaluated the frequency of headache as a prodromal symptom and its prognostic value in large vessel atherosclerotic infarction. 16% of patients experienced headache one week before stroke onset. (Table 1) We don't found any article about this finding. The only published article was in Denmark. In this country, Vestergaard found that sixty-five (27%) of the 238 patients experienced headache from 3 days before to 3 days after stroke.<sup>1</sup> Arboix showed that a history of previous vascular or tension-type headache was found in 40.5% of the headache group, but in only 23.5% of the non-headache group.<sup>6</sup> Also in this study we found that in patients with a positive history of headache, extensive lesion is more than in neuroimaging in comparison to other group. ( $p < 0.001$ ) It seems that in patients with large vessel atherosclerotic infarction that experienced headache as prodromal symptom, prognosis is poor. Etiology of headache in stroke patients is different. In some patients headache is closely associated with severe systolic BP elevation.<sup>11</sup> It may be related to activation of the trigeminovascular system or disturbance in biochemical markers of inflammation.<sup>11-15</sup> In conclusion, Although headache is not a common prodromal symptom for large vessel atherosclerotic infarction, it must be considered as a warning for stroke in patients without a background disease. In cases of stroke following headache, the prognosis tends to be poorer.

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