

# CORRELATIONAL ANALYSIS OF NEUROLOGICAL DEFICITS AND IMAGING PARAMETERS IN ATHEROTHROMBOTIC ISCHEMIC STROKE

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## Abstract

This article presents a clinical and diagnostic analysis of a patient with atherothrombotic ischemic stroke in 100 patients. During the study, the relationship between patients' age, gender, stroke severity (NIHSS), and MRI/CT and EEG indicators was studied. The results showed that the size and location of the stroke foci are directly correlated with the degree of neurological deficit ( $r = 0.71$ ). It was also statistically confirmed that the risk of re-stroke increased with age ( $p \approx 0.045$ ).

**Keywords:** Atherothrombotic ischemic stroke, MRT, CT, EEG, NIHSS.

## Introduction

Ischemic stroke remains one of the leading causes of disability and death worldwide. Atherothrombotic subtype strokes are characterized by their clinical course and high risk of recurrence. The integration of such methods as MRI, CT, and EEG into the diagnostic process is important in determining disease prognosis.

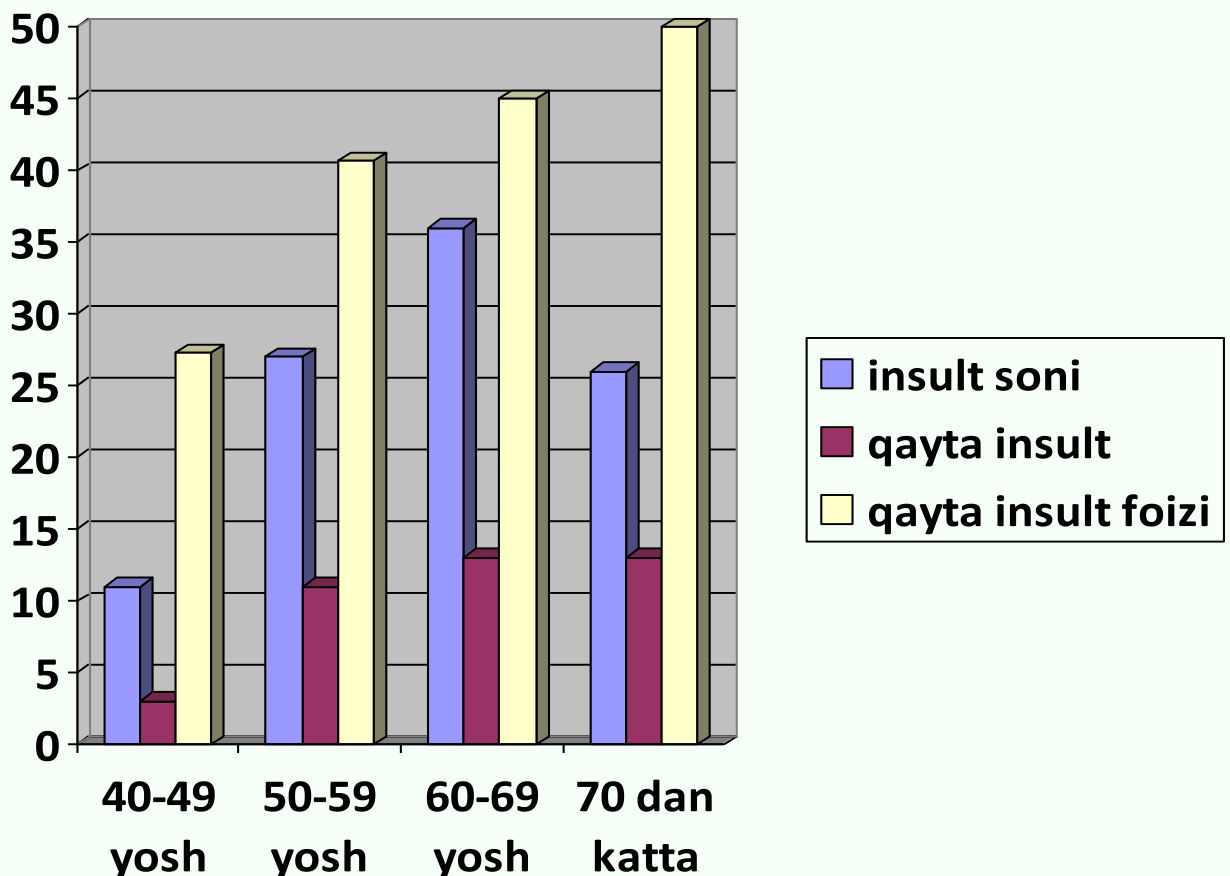
## 1. Research materials and methods.

**2.1 Research material:** The study involved 100 patients. Of these, 65 were males (65%), 35 (35%) were females and their age range from 42 to 83 years. The median age of incidence was  $62.3 \pm 2$ . All patients underwent follow-up and analysis during the acute phase of stroke (first 3 days).

**2.2 Research methods:** NIHSS scale clinical evaluation, MRI/CT imaging, and functional EEG analysis. For statistical analysis, the (Xi-squared) test and the Pearson correlation were used.  $\chi^2$ .

## 3. Results and Discussion.

### 3.1 Age groups and risk of re-stroke:



When patients were analyzed by age group in the study, the overall incidence of restrokes was 40%. The highest incidence of restroke was recorded in patients over 70 years, and in this group it was 50.0%. Re-strokes were 40.7% in the 50–

59 age group, and 36.1% in the 60–69 age group. Re-strokes were relatively rare in the relatively young age group — 40–49 — with 27.3%. Re-stroke increased with age. ( $\chi^2$  test  $\approx 6.21$ ,  $p \approx 0.045$ ).

### 3.2 NIHSS scores and clinical assessment:

Yengil insult (NIHSS 1–4): 28 bemor, o‘rtacha  $3,2 \pm 1,1$  ball;

O‘rta og‘ir insult (NIHSS 5–15): 47 bemor, o‘rtacha  $9,6 \pm 2,8$  ball;

Og‘ir insult (NIHSS  $\geq 16$ ): 25 bemor, o‘rtacha  $19,4 \pm 3,9$  ball;

Age Group	Total Patient	Yengil insult	O'rta and'ir insult	Og'ir insult
40–49 yosh	11	6 (54.5%)	4 (36,4%)	1 (9,1%)
50–59 yosh	27	9 (33,3%)	13 (48,1%)	5 (18,6%)
60–69 yosh	36	8 (22,2%)	17 (47,2%)	11 (30,6%)
$\geq 70$ yosh	26	5 (19,2%)	13 (50,0%)	8 (30,8%)
<b>Total</b>	<b>100</b>	<b>28 (28%)</b>	<b>47 (47%)</b>	<b>25 (25%)</b>

### 3.3 Characteristics of MRT/CT Results:

Furnace type	Small, local	Medium Size	Keng / multifokal
Patient count	20	47	33
Klinik kechish	Mild, short-term symptoms	Mean duration, significant neurological deficit	Og‘ir, diffuz simptomlar
Furnace localization	Area of small perforator arteries	Basically MCA Basin	Covers many arterial basins
Furnace Features	Local, small size, usually single focus	Medium size, in the area of one large artery	There are bulky, multi-focused, re-stroke scars
Complications	Minimal, high chance of a quick recovery	Motor, sensory, or cognitive deficits; rehabilitation is necessary	significant limitation in cognitive and motor functions; high risk of second stroke
Treatment / Rehabilitation	Monitoring, symptomatic treatment, physiotherapy minimal required	Thrombolytic therapy (if possible), antiplatelet, physiotherapy and rehabilitation	Comprehensive rehabilitation, long-term monitoring, antiplatelet or anticoagulant therapy

### 3.4 Analysis of instrumental diagnostics and localization of infarction.

MRT/CT: The "gold standard" for determining the structural location and size of a furnace. Large and multifocal foci (33 patients) are the group with the highest risk of re-stroke.

EEG: Allows early detection of functional changes. Increased focal delta activity and decreased alpha rhythm reflect levels of ischemia.

Localization of brain foci was observed mainly in the midcerebral artery (MCA) basin, which is the most common area in atherothrombotic ischemic strokes. A detailed analysis is as follows:

### **1. Left MCA (cerebral mid-artery) basin lesions: 46%**

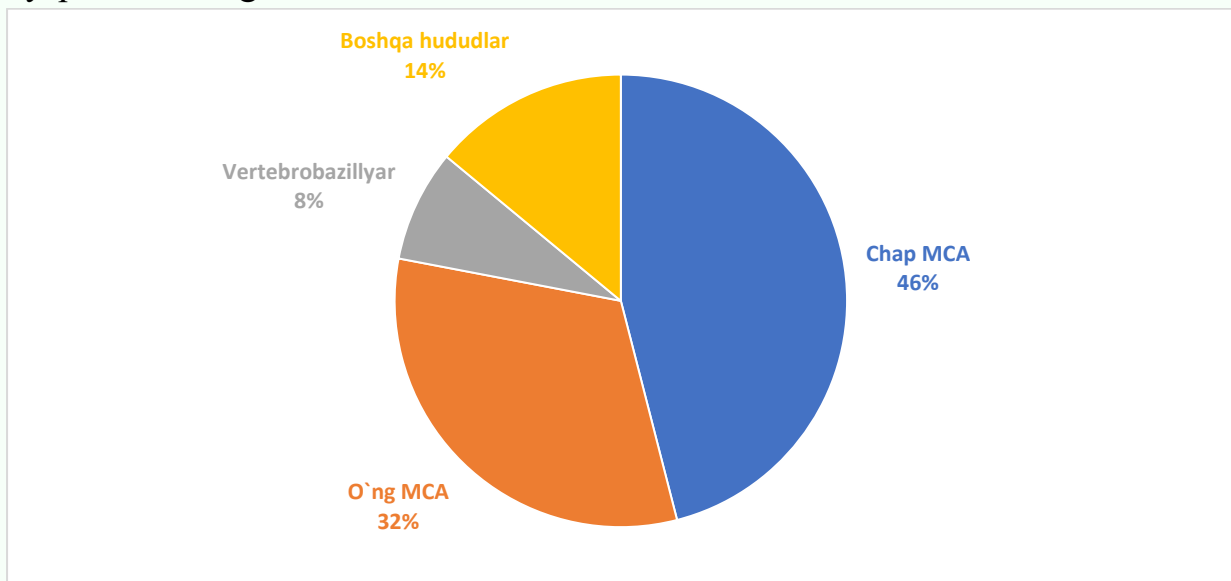
In left hemisphere infarctions, motor and sensory deficits often occur, and aphasia and speech disorders are also observed. NIHSS (National Institutes of Health Stroke Scale) scores were averagely high, and clinical delay was generally moderate to severe. These foci usually cover the frontal and temporal areas, causing hemiparesis and sensory deficits in the arms and legs.

### **2. Right MCA (cerebral midartery) basin lesions: 32%**

In infarctions of the right hemisphere, hemiparesis, hemiplegia are often observed. NIHSS scores may be slightly lower than left, but functional complications can significantly limit a patient's daily activities.

### **3. Vertebrobasillary havza zararlanishi: 8%**

Lesions to this area are less common, but can be clinically dangerous because it encompasses the cerebral cortex and cerebral structures. Such infarctions often disrupt balance, coordination, vision and thalamocortical reflexes. Feature of clinical course: symptoms are sometimes diffuse, often accompanied by severe dysphasic or cognitive deficits.





#### **4. Conclusion**

Neurological deficit severity in atherothrombotic stroke has a strong positive correlation with lung size ( $r = 0.71$ ).

The risk of re-stroke in patients aged 70 reaches 50%, which requires increased prevention in this group.

The combination of structural (MRI/CT) and functional (EEG) diagnostic methods allows for a more accurate assessment of changes in the early stages of stroke.