

STROKE



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Dear Doctor,

Greetings from Micro Labs. We are happy to bring you “Stroke Newsletter” which contains latest and interesting news in the field of Neuropsychiatry.

This issue contains:

- 1. The three-month prognosis in individuals with acute ischemic stroke is correlated with the triglyceride-to-high density lipoprotein cholesterol ratio.**
- 2. Deceptive Anticoagulation Adherence in the Prevention of Secondary Strokes**
- 3. Study on the Baseline Factors and Platelet Indices That Predict Patients' Outcomes after Thrombolytic Therapy in Acute Ischemic Stroke**
- 4. A patient who had non-severe COVID-19 has encephalitis with status epilepticus and stroke as sequelae.**



The three-month prognosis in individuals with acute ischemic stroke is correlated with the triglyceride-to-high density lipoprotein cholesterol ratio.

A neurological condition known as a stroke is characterised by blood vessel obstruction. Brain clots prevent blood from flowing properly, obstructing arteries and causing blood vessels to burst, which causes bleeding. Stroke can also result in dementia and depression.¹ The relationship between dyslipidemia and the frequency of ischemic stroke has been the subject of numerous investigations. As a result, the current study was conducted to investigate the relationship between adverse outcomes in patients with acute ischemic stroke and the triglyceride-to-high density lipoprotein cholesterol (TG/HDL-c) ratio Acute Ischemic Stroke (AIS).²

1764 patients with AIS were included in the study. In order to evaluate the linear relationship between the TG/HDL-c ratio and adverse outcomes for AIS patients, the researchers utilised a binary logistic regression model. To investigate the nonlinear link between the TG/HDL-c ratio and poor outcomes for AIS patients, a generalised additive model (GAM) and smooth curve fitting (penalised spline approach) were used.

The median TG/HDL-c ratio was 2.130, and the incidence rate of negative outcomes was 28.2%. The results of the binary logistic regression model revealed that there was no statistically significant correlation between the TG/HDL-c ratio and the likelihood of adverse outcomes for AIS patients after controlling for variables (Fig. 1). However, their association was nonlinear, and the TG/HDL-c ratio's infection threshold was 3.515. Each one-unit rise in the TG/HDL-c ratio was linked to a 22.6% decreased probability of adverse outcomes on the left side of the infection point (OR=0.774, 95%CI:0.656 to 0.914, p=0.002). The effect size (OR) on the right side of the infection point was 1.195 (95% CI:1.004 to 1.423, p=0.003).(Table 1)

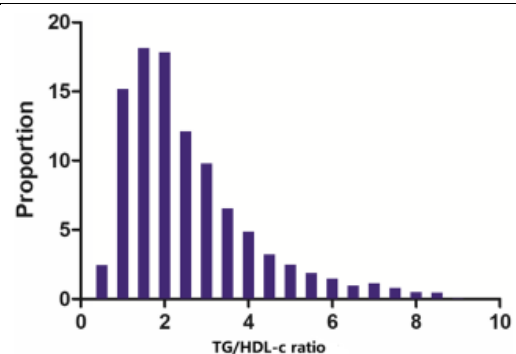


Figure 1: Distribution of TG/HDL-c ratio. It presented a skewed distribution while being in the range from 0.31 to 8.83



Table 1: The result of two-piecewise linear regression model

Unfavourable outcome	OR(95%CI,)	P
Fitting model by standard linear regression	0.950 (0.869, 1.039)	0.2595
Infection point of TG/HDL-c ratio	3.515	
≤3.515	0.774 (0.656, 0.914)	0.002
>3.515	1.195 (1.004, 1.423)	0.045
P for log-likelihood ratio test	0.004	

Serum level TG is a sign of malnutrition, which could affect the recovery of the nervous system. Acute ischemic stroke is also a metabolically demanding condition with high energy needs. Extra calories are stored by TG, which also supplies energy when the body is under metabolic stress. As a result, early nerve repair in AIS patients may suffer from lower TG levels. A high HDL-c concentration was linked to an elevated, according to Serhat TO et al.³

The TG/HDL-c ratio and adverse 3-month outcomes in AIS patients are related nonlinearly and have threshold effects. The risk of adverse outcomes is significantly adversely correlated with the TG/HDL-c ratio when it is lower than 3.515. The probability of poor outcomes in AIS patients was positively correlated with the TG/HDL-c ratio when it was higher than 3.515. This serves as a resource for increasing clinical communication and optimising lipidemia treatments in patients with AIS.

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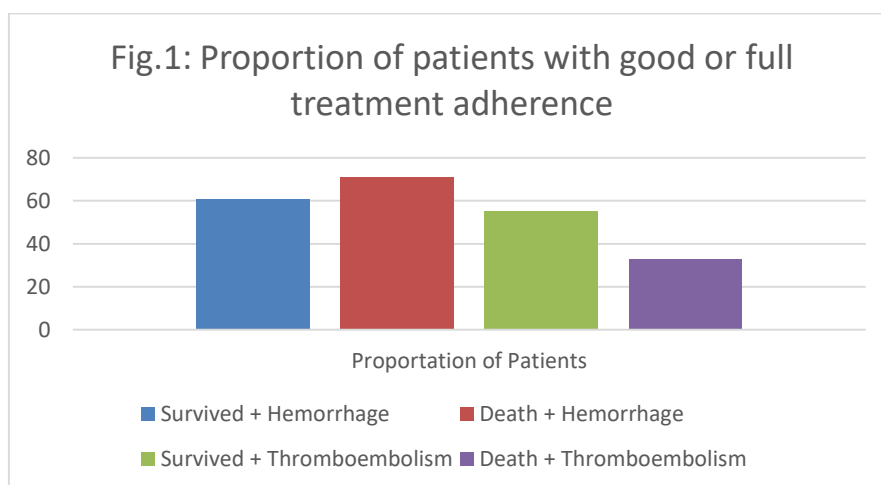


Deceptive Anticoagulation Adherence in the Prevention of Secondary Strokes

Approximately 20–38% of all ischaemic strokes are caused by atrial fibrillation (AF), which significantly raises the chance of having an ischemic stroke. Patients with atrial fibrillation who take oral anticoagulants (OAC) experience significantly lower ischemic stroke risk (AF) In recent investigations on the prevention of thrombosis, oral anticoagulants outperformed warfarin and other Vitamin-K antagonists.¹ When it comes to chronic diseases, there is a global issue with poor adherence to medication, especially OACs. A top priority in preventing strokes is patient adherence to OAC therapy in those with AF. In order to examine treatment adherence to OACs in the secondary prevention of stroke and identify determinants of adherence, this study used a retrospective analysis of data from specific patient records.²

Patients having an ischemic stroke with AF discharge diagnosis were included in this retrospective cohort analysis. The Estonian Electronic Health Record, Estonian Electronic Prescription, and Electronic Hospital Information systems all collected data from patient charts.

237 (67%) of the 353 patients had OAC medication recommended to them at discharge, and 202 (85%) of them utilised it in the first year following their stroke. Only 68% of people had good adherence, with a mean adherence rate of 81%. 68 patients (39%) received non-vitamin K antagonist OAC (NOAC) at a reduced dose, which was justified in 23 (34%). Logistic regression study found that the only significant factor for good treatment adherence was the incidence of the first stroke. Among the patients receiving OAC treatment, there were 47 individuals (or 23%) who had problems. The majority of patients (52% of patients with thromboembolic events and 70% of patients with hemorrhagic complications) adhered to their treatment regimens well. (Fig.1)



The treatment adherence to OACs in patients with AF after stroke was shown to be limited in this investigation using real-world individual patient data; the mean treatment adherence was



81%.² Only 68% of the patients had good or full adherence during the first year after stroke, despite the fact that the mean adherence was good. Moreover, only 50% of patients received adequate prophylaxis when the proper OAC dosage was taken into account. The single element that helped them adhere well was their first stroke. Less than half of the individuals who had their AF identified prior to stroke were taking anticoagulants. Other studies have similarly demonstrated the underuse of OACs in patients with AF before a stroke.^{2,3}

The study revealed that OAC medication adherence after stroke was low and that only having experienced one prior stroke might predict good or complete treatment adherence

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Study on the Baseline Factors and Platelet Indices That Predict Patients' Outcomes after Thrombolytic Therapy in Acute Ischemic Stroke

The most common cause of death and disability worldwide is stroke. The conventional therapy for acute ischemic stroke is intravenous thrombolytic therapy with recombinant tissue plasminogen activator (rtPA).¹ The investigation of baseline traits that affect 3-month clinical outcomes in patients with acute ischemic stroke (AIS) following thrombolytic therapy was the aim of the study.

A total of 241 AIS patients receiving thrombolytic treatment with recombinant tissue plasminogen activator were enrolled in this trial in a timely manner. The National Institutes of Health Stroke Scale (NIHSS), the Trial of Org 10172 in Acute Stroke Treatment (TOAST), risk factors, platelet indices, and lipid parameters were evaluated as baseline characteristics at the time of admission. According to the modified Ranking Scale at three months, the individuals were classified as having satisfactory or poor functional results. To investigate the relationship between baseline characteristics and results, the multivariate logistic regression was used. To determine whether there were any linear relationships between platelet indices and other outcomes, Pearson correlation was performed.



The NIHSS, TOAST classification, diabetes, and mean platelet volume (MPV) were found to be significant predictors of clinical outcomes in AIS patients after three months in multivariate logistic regression analysis. (Table 1) In particular, in patients with large-artery atherosclerotic stroke, the study discovered a connection between higher MPV and worse outcome at 3 months. ($r = -0.375$, $p = 0.000$) There is a negative correlation between MPV and platelet count. In patients who have a good prognosis, MPV and platelet-to-lymphocyte ratio (PLR) ($r = 0.83$, $p = 0.000$) and MPV and platelet distribution width (PDW) ($r = 0.820$, $p = 0.000$) show both highly positive linear associations.

Table 1: Multivariate logistic regression model of predictors to poor outcome

Characteristic	β	SE	p value	OR	95% CI	
					lower	upper
MPV	2.167	0.413	0.000	8.732	3.884	19.632
TGs	-0.558	0.256	0.029	0.572	0.347	0.945
PLR	-0.261	0.054	0.000	0.770	0.693	0.856
NIHSS	0.240	0.043	0.000	1.271	1.169	1.382
Diabetes (1)	1.651	0.472	0.000	0.192	0.076	0.483
TOAST (3)			0.004			
TOAST (1)	-1.530	0.615	0.013	0.217	0.065	0.723
TOAST (2)	0.224	0.561	0.689	1.252	0.417	3.758

In AIS patients who had received thrombolytic therapy, the study found that the NIHSS, TOAST, DM, and MPV were significant predictors of functional outcomes at 3 months. Good outcomes were indicated by lower entrance NIHSS and MPV scores. In patients with favourable outcomes, there are strong positive linear relationships between MPV and PLR as well as MPV and PDW. The relationships between MPV, PDW, and PLR should be useful in assessing stroke patients' prognoses. Mean platelet volume (MPV), platelet count (PC), platelet distribution width (PDW), and plateletcrit (PCT) are clinical platelet markers that have been studied in a variety of disorders. According to Sadeghi F et al., larger platelets are more metabolically and functionally active.

Overall, patients with AIS who had lower NI- HSS and MPV levels upon admission had better functional results following treatment. Thrombolytic medication. The relationships between PDW, MPV, and platelet-to-lymphocyte ratio merit additional investigation as they may be useful in assessing prognosis in stroke patients.



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A patient who had non-severe COVID-19 has encephalitis with status epilepticus and stroke as sequelae.

Numerous variables, including harm to certain receptors, subsequent hypoxia, cytokine-related injury, and retrograde travel along the olfactory nerve and bulb, are thought to contribute to the neurological manifestations of COVID-19.¹ Severe neurological side effects such as seizures, encephalitis, and stroke have already been documented among the various neurological disorders of COVID-19. Seizures made up between 0.5 and 1% of neurological problems and were frequently linked to systemic abnormalities, which suggests an acute symptomatic seizure.² In this report, a patient with many serious neurological problems with concurrent mild COVID-19 is described. The patient made a full recovery following a multimodal treatment plan.³

A 21-year-old patient who had previously been in good health arrived with a first-onset seizure. A concurrent non-severe COVID-19 pneumonia diagnosis was made. A cerebrospinal fluid (CSF) analysis revealed lymphocytic pleocytosis and increased CSF IL-6 levels. Status epilepticus emerged while the patient was in the hospital being treated for autoimmune encephalitis, and the frequency of the seizures was temporally associated with the CSF IL-6 level. Furthermore, there was no significant cardioembolic source for the new embolic stroke that developed. The pneumonia associated with COVID-19 was completely cleared, in contrast to the exacerbated neurological complications. The patient was discharged with a nearly full recovery following treatment with anti-seizure drugs, antithrombotics, antiviral drugs, and immunotherapy.

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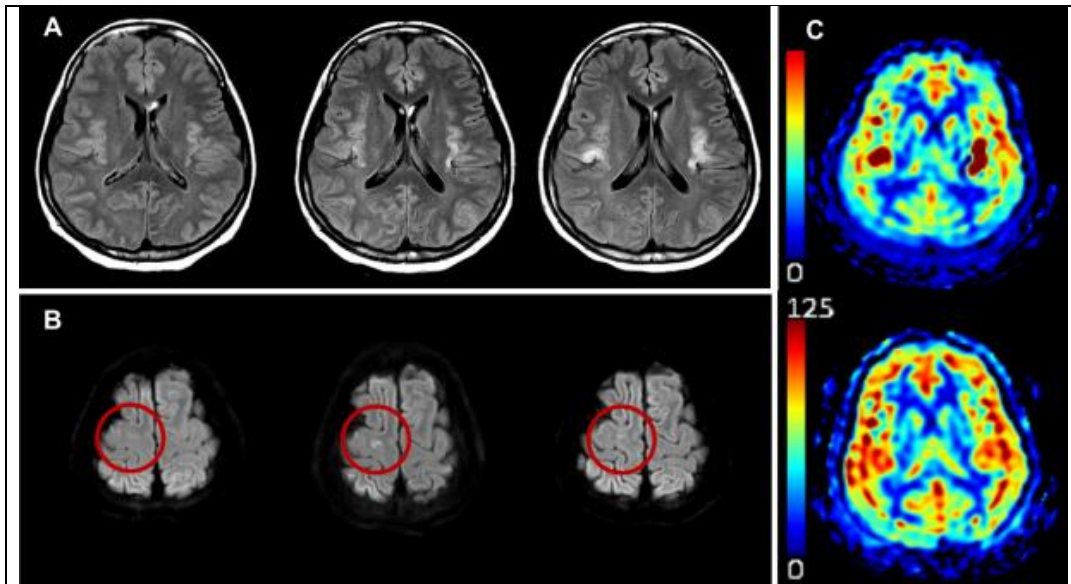


Figure 1: Magnetic resonance imaging findings along the treatment period

This case demonstrates how numerous serious neurological issues simultaneously emerged in a patient with non-severe COVID-19 and how a multimodal therapy strategy led to a successful recovery. The dysregulated immune response that resulted in thromboinflammation and neuroinflammation can be defined as the common factor in the emergence of the neurological problems seen in our case.³

Even in mild cases of COVID-19, active serological and radiological evaluation can be helpful. Immunotherapy is one of the multifaceted treatment modalities that can successfully reverse the neurological complication.

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