

Prevalence and clinical characteristics of Embolic Stroke of Undetermined Source

S. Ziada, M. Messelmani, H. Derbali, M. Mansour, I. Bedoui, J. Zaouali, R. Mrissa

Departement of Neurology, Military Hospital, Tunis, Tunisia

Introduction:

One-third of ischemic strokes have no identifiable cause following standard evaluation. In 2014, the clinical construct of Embolic Stroke of Undetermined Source (ESUS) was introduced. The purpose of this study was to report the prevalence and clinical characteristics of ESUS.

Materials and methods:

We performed a descriptive, retrospective study covering a period of 6 years from January 2015 to December 2020 and including patients hospitalized for ESUS in the neurology department of military hospital of Tunis. ESUS was defined as a radiologically confirmed nonlacunar brain infarct in the absence of extracranial or intracranial atherosclerosis causing $\geq 50\%$ luminal stenosis in arteries supplying the ischemic area, major-risk cardioembolic source, and any other specific cause of stroke. Clinical features was collected and analyzed.

Results:

Among 382 patients admitted for ischemic stroke, 63 (16.5%) were classified as ESUS. The average age of the patients was 58 years. The male/female sex ratio was 1.86. The most prevalent risk factor was arterial hypertension (61%), 47% of patients were diabetics (Figure 1) and 14.5% had no cardiovascular risk factors.

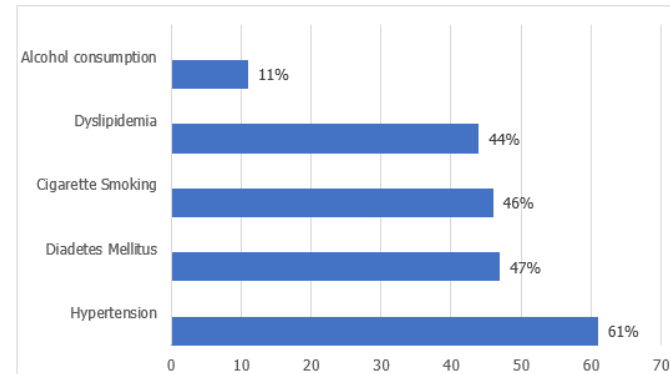


Figure 1: Distribution of cardiovascular risk factors in our study

ESUS were of moderate severity (median National Institute Health Stroke Scale score, 5) (Figure 2).

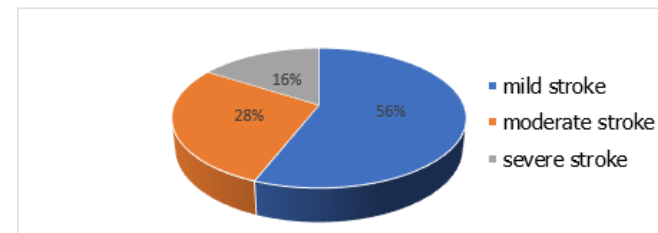


Figure 2: Distribution of patients according to the severity of the stroke

Among potential causes of the ESUS, left ventricular disease (32%), minor heart valve diseases (21%), non-stenotic carotid artery plaques (13%) have been mainly identified. Ninety-two percent of our patients received aspirin. Recurrent stroke occurred in 13 patients.

Conclusions

ESUS comprises about 17% of all ischemic stroke. Despite strict diagnostic criteria, ESUS definition ignores major clinical aspects, so including heterogeneous cases.

Patients with ischemic stroke meeting criteria for ESUS were relatively young this may reflect incomplete diagnostic investigation of older patients with stroke that permit the diagnosis of ESUS [1].

As mentioned in our study, hypertension is the main cardiovascular risk factor [2]. ESUS patients had, on average, minor strokes, consistent with small emboli. The NIH Stroke Scale score near ESUS onset averaged 5 [3]. There is an important need to identify the potential causes of ESUS in order to define better antithrombotic prophylaxis for this frequently occurring subtype of ischemic stroke and prevent stroke recurrence [4].

References:

- [1] Ntaios G, Lip GYH, Vemmos K, et al. Age- and sex-specific analysis of patients with embolic stroke of undetermined source. *Neurology*. 2017;89(6):532-539.
- [2] Tsvigoulis G, Kargiotis O, Katsanos AH, et al. Incidence, characteristics and outcomes in patients with embolic stroke of undetermined source: A population-based study. *J Neurol Sci*. 2019;401:5-11.
- [3] Lattanzi S, Rinaldi C, Pulcini A, et al. Clinical phenotypes of embolic strokes of undetermined source. *Neurol Sci*. 2021;42(1):297-300.
- [4] Hart RG, Veltkamp RC, Sheridan P, Sharma M, Kasner SE, Bangdiwala SI, et al. Predictors of Recurrent Ischemic Stroke in Patients with Embolic Strokes of Undetermined Source and Effects of Rivaroxaban Versus Aspirin According to Risk Status: The NAVIGATE ESUS Trial. *J Stroke Cerebrovasc Dis*. 2019;28(8):2273-9.