PIVOTAL STUDY ON ULTRASOUND-BASED SARCOPENIA ASSESSMENT IN ACUTE STROKE PATIENTS

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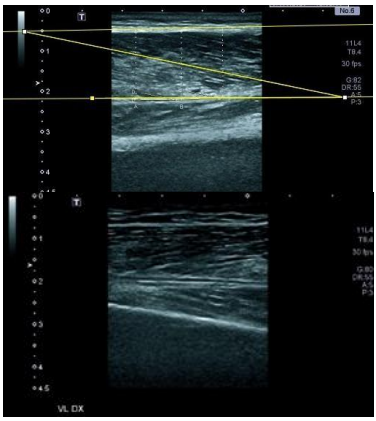
Background and aims

Patients with acute stroke (AS) undergo significant morphological and structural changes in skeletal muscle, largely due to disuse, limited mobility and denervation[1]. Among the available assessment tools, measurement of the pennation angle (PA) and muscle thickness (MT) of the vastus lateralis (VL) muscle has emerged as a simple, rapid and effective method for evaluating muscle mass and quality[2]. However, limited data are available on the use of ultrasound to assess these parameters during the acute phase of stroke. This pivotal study aimed to evaluate changes in the PA and MT of the VL in a cohort of single-center Stroke Unit and to explore associated clinical and epidemiological characteristics.

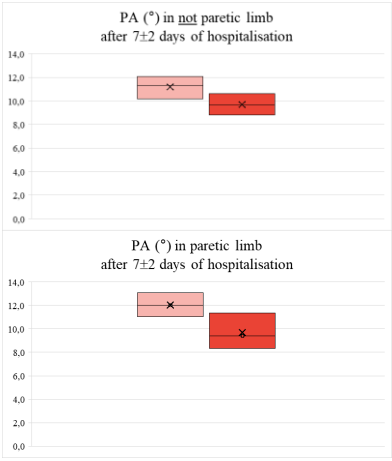
Materials and methods

Clinical, laboratory and ultrasound data were collected from 11 patients with AS and a neurological deficit affecting one lower limb, as confirmed by neurological evaluation at 24 hours. The study was conducted between March and May 2025 at the Stroke Unit of the University Hospital of Trieste. MT and PA of both VL muscles were assessed using ultrasound. The initial ultrasound examination was performed between 24 and 72 hours after symptom onset, and the follow-up assessment was conducted at 7 ± 2 days.



Results

The median age of the cohort was 79 years (77–83), and the median NIHSS score at admission was 6 (4–13). Eight patients had an ischaemic stroke (IS). Of these, six underwent reperfusion treatment - 4 received intravenous thrombolysis (IVT) and two underwent IVT and endovascular thrombectomy (EVT). Ultrasound assessment revealed a 15.4% reduction in the PA and a 0.4 mm decrease in MT of the VL in the limb affected by the neurological deficit. In the unaffected limb, a 19.2% reduction in PA and a 0.7 mm decrease in MT were also observed. In this pivotal study in patients with AS, the PA and MT of the VL undergo a rapid reduction within the first 7 days after symptom onset. These changes occur in both the affected and unaffected lower limbs.



Conclusions

Ultrasound assessment may be a useful tool for evaluating sarcopenia and muscle mass during the acute phase of stroke. These preliminary findings highlight the potential role of ultrasound in early assessment and warrant further investigation in larger patient cohorts to explore possible correlations with functional outcomes and future rehabilitation therapies.

References

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