Clinical commentary

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A multimodal diagnostic approach for lateralised rhythmic delta activity in the ictal-interictal continuum*

Maddalena Spalletti [1], Francesca Pescini [2], Davide Gadda [3], Benedetta Piccardi [2], Maenia Scarpino [1,4], Riccardo Carrai [1,4], Cristina Boccardi [1], Antonello Grippo [1,4], Aldo Amantini [1,4]

[1] SOD Neurofisopatologia, Dipartimento Neuromuscoloscheletrico e Organi di Senso, AOU Careggi,
[2] SOD Stroke Unit, Dipartimento DEA, AOU Careggi,
[3] SOD Neuroradiologia, Dipartimento dei Servizi, AOU Careggi,
[4] IRCCS Fondazione Don Carlo Gnocchi, Florence, Italy

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- Lateralised rhythmic delta activity (LRDA) is an ictal-interictal continuum (IIC) pattern that has only recently been investigated and recognised as potentially ictogenic or sometimes even ictal.
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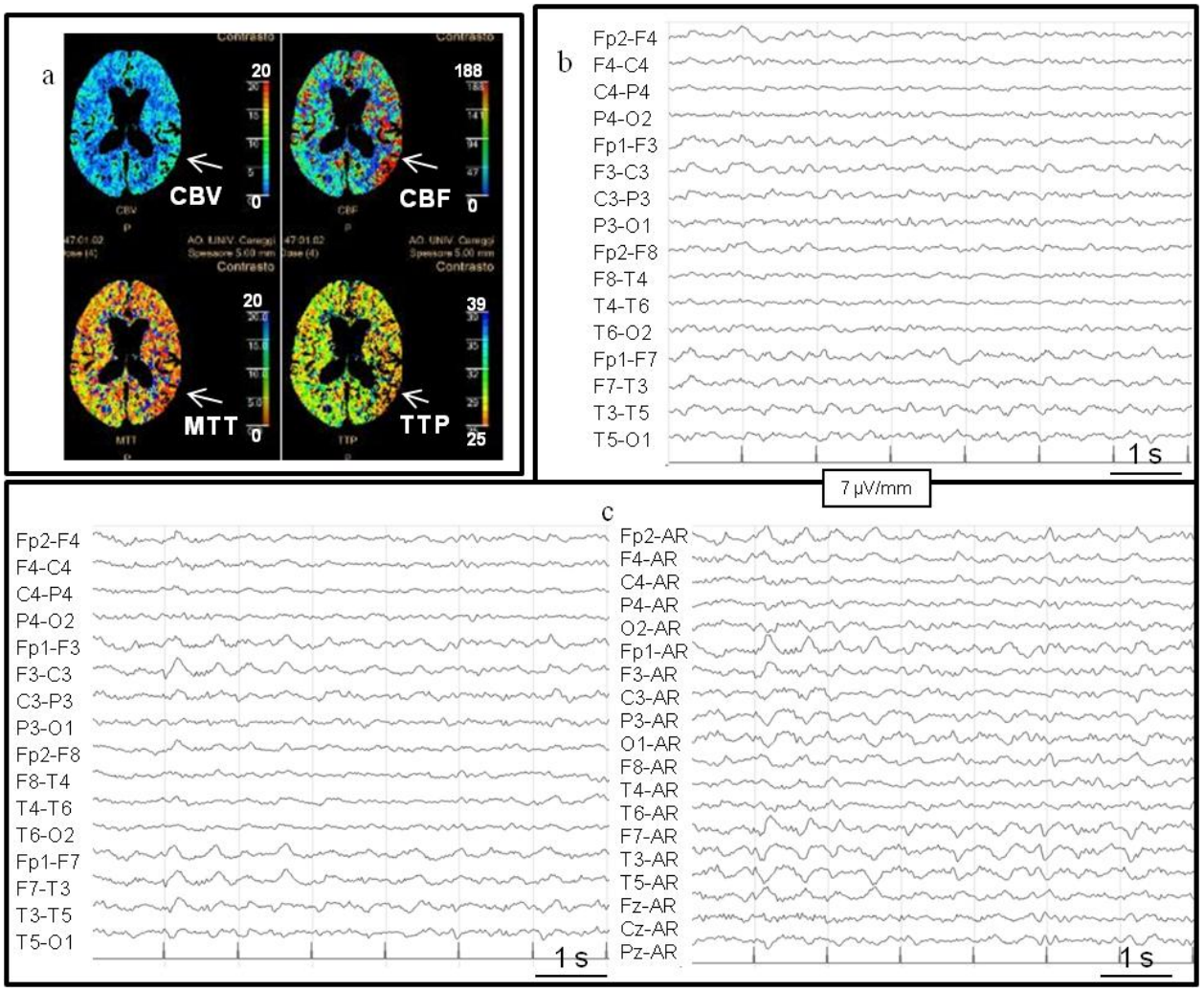
- We describe a patient who presented with acute-onset aphasia, suspected of having a stroke. Advanced brain imaging with CT-perfusion (CTP) showed features suggesting regional left temporo-parietal hyperperfusion and an EEG revealed LRDA with fluctuations and intermixed sharp waves in the same areas. Treatment with lacosamide caused both clinical and EEG improvement after a few hours.



(A) Computed tomography-perfusion on the left temporo-parietal areas (white arrows) showing a relative increase in cerebral blood volume (CBV) and cerebral blood flood (CBF) with minimal values for mean transit time (MTT) and time to peak (TTP), suggesting hyperperfusion.

(B) (B ,C) EEG recorded one hour after tCTP (sensitivity: 7 µV/mm). (B) Lateralised rhythmic delta activity (LRDA) on the left hemisphere with a prevalence in the temporal areas. (C) On the same recording, LRDA occasionally showed a sharp aspect (bipolar longitudinal montage [left] and average reference montage [right] of the same trace).

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- When the diagnostic criteria for NCSE (Leitinger *et al.*, 2015) are incompletely or equivocally fulfilled, EEG alone is not sufficient for the diagnosis of an ictal pattern. Recent expert opinions suggest that the clinical features, fine analysis of EEG discharges, adjunctive data from neuroimaging, and a pharmacological trial are needed.

- In our patient, the finding of hyperperfusion on CTP and the clinical and EEG response to AED lead us to interpret the overall clinical presentation as focal NCSE with fluctuating sharp LRDA, representing IIC activity rather than ischaemic or post-ictal slowing.