Is high frequency activity always part of the seizure onset pattern in humans?

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The study of intracerebral EEG seizure onset patterns (SOP)is crucial to accurately define the epileptogenic zone and guide successful surgical resection. It also raises important pathophysiological issues concerning mechanisms of seizure generation. Until now, several seizure onset patterns have been described using distinct recording methods (subdural, depth electrode), mostly in temporal lobe epilepsies or with heterogeneous neocortical lesions. These studies have revealed that in a variable proportion of cases (30- 50%), SOP do not involved rapid discharges (beta-gamma range of frequencies). The significance of these "slow" patterns is unclear. Most of the authors have privileged a simple "propagation" mechanisms for these patterns. However, slow pattern can be observed in cases of epileptogenic lesions. We will describe cases with well documented slow patterns of SOP, and we will report the findings obtained in a series of SEEG explored patients with focal cortical dysplasia (FCD) or neurodevelopmental tumours (NDT). In 25% of these cases, no rapid/fast activities were recorded. These patterns were not observed in FCD type 2, in contrast with other etiologies (NDT or FCD type 1). The surgical prognosis was less favorable in cases without rapid activities.

Thus, slow SOP may be observed in some cases of focal epilepsies. The mechanisms involved in seizure genesis are probably different from those involved in rapid discharges