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Case Report

Sub Clinical Rhythmic Electrographic Discharges in Adults in Acute Confusional State

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Abstract

Sub clinical rhythmic electrographic discharges in adults (SREDA) are rare rhythmic Electroencephalography (EEG) pattern with unknown significance. We report a patient with difficulty in way finding and recurrent episodes of acute confusion state in whom two serial EEG recordings showed SREDA. Careful EEG analysis is essential to avoid misinterpretation of benign epileptiform variants. The relation between SREDA and seizure is inconclusive and many features of SREDA are still unresolved.

Keywords: *EEG; SREDA; Intermittent Confusional State*

Introduction

Subclinical rhythmic electrographic discharges in adults (SREDA) are rare benign epileptiform variants. They abide a similarity to epileptic seizures due to their epileptiform facade but are not true epileptiform abnormalities [1]. SREDA has been described as a benign Electroencephalography (EEG) phenomenon. Typical SREDA pattern was point up by Westmoreland and Klass as "an unusual transient EEG pattern consisting of repetitive bilateral sharp contoured waveforms in the range of theta to delta frequency lasting for few seconds to minutes, distributed mainly over the parietal and temporal regions, without subsequent evolution in frequency, distribution or morphology" [2,3]. Clinical significance of SREDA is still unclear. Though SREDA is a very rare benign epileptiform variant, identification of this EEG pattern is very important. One should cautious while reading EEG to distinguish between SREDA and electrographic seizure.

Case Report and EEG Pattern

A 54-year-old woman with intermittent way finding difficulty of ten years of duration and occasional episodes of confusion was seen in the out-patient department. No other neurological deficit noticed and her Magnetic Resonance Imaging (MRI) of brain was normal. EEG study was done by using a digital Video-EEG system (Nicolet one M40, Viasys health care Inc, Madison, United States of America) with scalp disk electrodes placed according to the international 10/20 system at a sampling rate of 1024 Hz with low frequency filter at 0.3 Hz and high frequency filter at 70 Hz.

EEG consisted of abrupt onset of generalized 5 - 6 Hz theta activity, better seen over bilateral parieto- temporal leads. The rhythmical activity was sustained without any gradual change in amplitude, frequency and morphology for about 40 - 110 seconds. An abrupt termination of SREDA noted at the end without showing any signs of post ictal slowing (Figures 1-3). All these events occurred in the wakefulness. During the SREDA the patient had no clinical evidences of seizures and responded to all commands. SREDA was present in both consecutive EEG recordings.

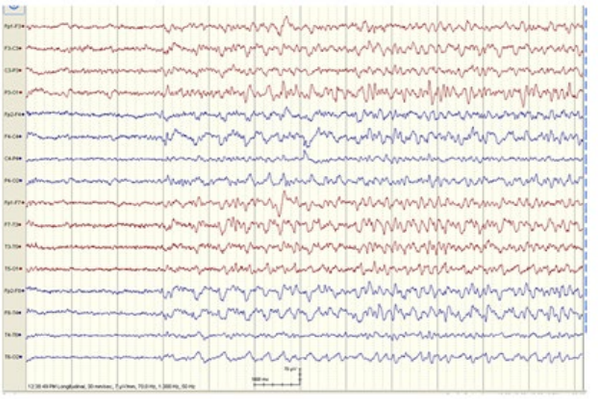

Figure 1: *Sudden onset of SREDA; theta rhythm better expressed over bilateral parieto-temporal leads.*

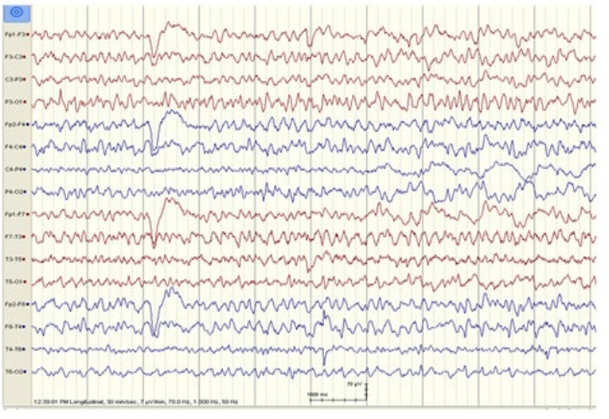

Figure 2: *SREDA without any significant evolution in the amplitude, morphology or frequency; no clinical manifestation noticed.*

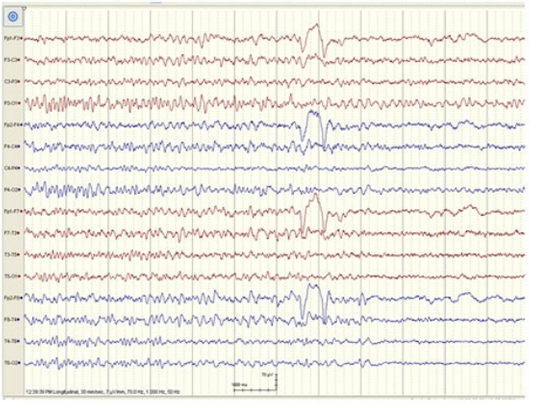

Figure 3: *Abrupt offset of SREDA without any post ictal changes.*

Discussion

There are few reports in the literature about this rare EEG pattern. Although SREDA is a transient discharge, its rhythmic appearance and lasting for extended period can direct to misinterpret as electrographic seizure. SREDA occurs mostly in adults and tends to be persistent. Few cases are reported in Children's also [4,5]. In our patient the SREDA was recorded in both two consecutive EEGs. The mechanism underlying the SREDA is not well established. The theory proposed by Naquet., *et al*. is that it may be related to hypoxic/ischemic mechanisms in old patients [6]. Thomas., *et al*. in a study with single photon emission computed tomography (SPECT) concluded that SREDA cannot be considered as an epileptic pattern and may be associated to vascular mechanisms [7].

We are mentioning some of the relevant previous case reports published about SREDA. Silva., *et al*. reported SREDA in one patient presented with Transient ischemic attack [8]. Begum., *et al*. reported SREDA in acute brain dysfunction followed by recovery [9] and Fukuta., *et al*. reported SREDA in cerebellar degeneration [10]. A recent study done by GK Dash and Ashalatha Radhakrishnan reported that two cases found to have seizures during the follow up [11]. SREDA seen in this patient present with acute confusional state may be a coincidence. Patient did not having any clinical manifestation during the recording. Our patient is under close follow up.

In majority of previous observations SREDA consists of EEG frequency in the range of 4 - 7 Hz without any evolution in the morphology and well expressed over the parieto-temporal areas. It occurs mostly in adults and tends to be persistent. SREDA seen in our patient with acute confusional state may be a coincidence. SREDA was presented in both two consecutive EEGs. Patient did not having any clinical manifestation during the recording. The question remains unresolved about the relationship of parieto-temporal appearance of SREDA and the intermittent episodes of confusional state. We could not do SPECT/PET in our patient. More case reports and follow up studies are required to resolve the ambiguity. The pathophysiology is yet to be known.

Conclusion

SREDA is an unusual transient paroxysmal electroencephalographic pattern. It may have a resemblance to electrographic seizure and careful analysis is required to avoid over-interpreting EEG records.

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