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The data represented here are in relation with the manuscript "Quantitative assessments of extracellular EEG to classify specific features of main phases of seizure acquisition based on kindling model in Rat" (Jalilifar et al., 2017) [1] which quantitatively classified different main stages of the kindling process based on their electrophysiological characteristics using EEG signal processing. The data in the graphical form reported the contribution of different sub bands of EEG in different stages of kindling-induced epileptogenesis. Only EEG signals related to stages 1–2 (initial seizure stages (ISSs)), 3 (localized seizure stage (LSS)), and 4–5 (generalized seizure stages (GSSs) were transferred into frequency function by Fast Fourier Transform (FFT) and their power spectrum and power of each sub bands including delta (1–4 Hz), Theta (4–8 Hz), alpha (8–12 Hz), beta (12–28 Hz), gamma (28–40 Hz) were calculated with MATLAB 2013b. Accordingly, all results were obtained quantitatively which can contribute to reduce the errors in the behavioral assessments.

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1. Data

The data of this study were collected from an animal in vivo study aiming at quantitative assessment of epileptogenesis in a rapid kindling model in rats [1]. Considering the unique features of EEG for seizure prediction [2], these data present the raw data of spectral analyses of the field potentials recorded during the progression of Amygdala kindling in rats to determine the quantitative features of main phases of kindling acquisition. In this paper, stages 1 and 2 of kindling were considered initial seizure stages (ISSs), stage 3 as localized seizure stage (LSS), and stages 4 and 5 as generalized seizure stages (GSSs). Tables 1–3 present the spectral powers of different sub bands of EEGs in ISSs, LSSs, and GSSs of the kindling process, respectively. Moreover, Table 4 presents percentage of different sub bands power in the control group.

Table 1
Contribution of different sub bands power in ISSs. We reported the mean value for each rat.

| Rats | Delta | Theta | Alpha | Beta | Gamma |
|------|-------|-------|-------|------|-------|
| Kindle ISSs |       |       |       |      |       |
| Rat 1 | 0.64  | 0.29  | 0.03  | 0.03 | 0.01  |
| Rat 2 | 0.34  | 0.37  | 0.14  | 0.12 | 0.03  |
| Rat 3 | 0.52  | 0.26  | 0.1   | 0.1  | 0.02  |
| Rat 4 | 0.55  | 0.28  | 0.09  | 0.07 | 0.02  |
| Rat 5 | 0.4   | 0.43  | 0.08  | 0.06 | 0.01  |
| Rat 6 | 0.73  | 0.22  | 0.03  | 0.02 | 0.0047|
| Rat 7 | 0.46  | 0.31  | 0.1   | 0.1  | 0.03  |
| Rat 8 | 0.56  | 0.28  | 0.07  | 0.08 | 0.01  |
| Rat 9 | 0.58  | 0.29  | 0.06  | 0.06 | 0.01  |
| Rat 10| 0.45  | 0.33  | 0.09  | 0.1  | 0.03  |
2. Experimental design

2.1. Materials and methods

Adult male rats weighing 200 ± 10 g were housed individually under standard conditions (an ambient temperature (25 ± 2 °C) and 12-h light: 12-h dark: 12-h light cycle).

Rats were randomly divided into two groups (ten for the kindle group and 6 for sham) and anesthetized under intraperitoneal injection of ketamine (100 mg/kg) and Xylazine (10 mg/kg) mixture [3]. One tripolar stainless steel electrode (a bipolar for stimulating and a monopole for recording EEG signal) was implanted in amygdala using Paxinos and Watson atlas coordinates: for amygdala targeting, anteroposterior: -2.5 mm; lateral: 4.8 mm; vertical: 7.2 and 0.2 mm below the skull [4]. Three holes were drilled, one for positioning a monopolar electrode attached to a screw which was located near the frontal lobe as ground and reference, the two for anchor screws. Electrodes and screws were fixed using acrylic dental cement and attached to a socket. The protocol of

| Table 2 |
The percentage of different frequencies in LSSs. We reported the mean value for each rat.

| Rats | Delta | Theta | Alpha | Beta | Gamma |
|------|-------|-------|-------|------|-------|
| Kindle LSSs | Rat 1 | 0.4 | 0.31 | 0.09 | 0.16 | 0.03 |
| Rat 2 | 0.32 | 0.34 | 0.12 | 0.18 | 0.03 |
| Rat 3 | 0.23 | 0.25 | 0.17 | 0.32 | 0.03 |
| Rat 4 | 0.44 | 0.31 | 0.12 | 1 | 0.01 |
| Rat 5 | 0.32 | 0.36 | 0.09 | 0.19 | 0.04 |
| Rat 6 | 0.52 | 0.28 | 0.07 | 0.12 | 0.02 |
| Rat 7 | 0.22 | 0.37 | 0.2 | 0.18 | 0.03 |
| Rat 8 | 0.59 | 0.3 | 0.05 | 0.06 | 0.01 |
| Rat 9 | 0.47 | 0.31 | 0.09 | 0.11 | 0.02 |
| Rat 10 | 0.57 | 0.26 | 0.08 | 0.08 | 0.01 |

| Table 3 |
contribution of different sub bands power in GSSs. We reported the mean value for each rat.

| Rats | Delta | Theta | Alpha | Beta | Gamma |
|------|-------|-------|-------|------|-------|
| Kindle GSSs | Rat 1 | 0.36 | 0.3 | 0.15 | 0.16 | 0.03 |
| Rat 2 | 0.35 | 0.32 | 0.13 | 0.18 | 0.03 |
| Rat 3 | 0.23 | 0.35 | 0.17 | 0.23 | 0.02 |
| Rat 4 | 0.27 | 0.29 | 0.2 | 0.23 | 0.02 |
| Rat 5 | 0.5 | 0.27 | 0.07 | 0.13 | 0.02 |
| Rat 6 | 0.61 | 0.28 | 0.05 | 0.06 | 0.01 |
| Rat 7 | 0.4 | 0.28 | 0.14 | 0.17 | 0.02 |
| Rat 8 | 0.56 | 0.34 | 0.05 | 0.04 | 0.01 |
| Rat 9 | 0.42 | 0.37 | 0.1 | 0.1 | 0.02 |
| Rat 10 | 0.59 | 0.27 | 0.69 | 0.06 | 0.01 |

| Table 4 |
Contribution of different sub bands power in sham group. We reported the mean value for each rat.

| Rats | Delta | Theta | Alpha | Beta | Gamma |
|------|-------|-------|-------|------|-------|
| Sham | Rat 1 | 0.21 | 0.31 | 0.13 | 0.27 | 0.07 |
| Rat 2 | 0.24 | 0.26 | 0.15 | 0.25 | 0.09 |
| Rat 3 | 0.28 | 0.32 | 0.13 | 0.2 | 0.07 |
| Rat 4 | 0.3 | 0.29 | 0.12 | 0.2 | 0.06 |
| Rat 5 | 0.24 | 0.28 | 0.14 | 0.27 | 0.07 |
| Rat 6 | 0.32 | 0.26 | 0.14 | 0.21 | 0.07 |
| Rat 7 | 0.24 | 0.3 | 0.16 | 0.25 | 0.06 |
this study was approved by local ethics committee of Ahvaz Jundishapur University of Medical Sciences (Code: U-94147) that was in complete compliance to the guide for the care and use of laboratory animals by the National Institutes of Health (National Institutes of Health publication No. 86-23). Following a 10-day recovery period after surgery, the threshold intensity was determined using a 3 s of monophasic square wave of 50 Hz initially applied at 30 µA and it was increased in step of 15 µA at 15 min intervals until emerging at least 6 s of afterdischarges (ADs). All rats in the kindle group were subjected to daily stimulation using a 3 s train of 50 Hz monophasic pulses of 1ms duration with threshold intensity which were applied 12 times daily with 5 min intervals [5], whereas sham animals only experienced stimulation condition and received placebo stimulation (Fig. 1). Therefore, the EEG of sham animals can be considered as a baseline. Behavioral development of kindling acquisition was scored according to Racine stages [6]. This process was continued until emerging stage 5 of kindling. EEG signals recorded from the implanted electrode in the amygdala and monitored with electro module system (Tehran, Iran) which was connected to computer using e-probe software. During kindling acquisition, we could save the starting and ending time of each stage of kindling as a text file (an event file) which can be considered in extracting each stage. Data were digitized at a sampling rate of 10 KHz. Moreover, the electro module automatically applied a filter on 50 Hz frequency to remove DC effect from the signals. Recorded EEG signals were saved as binary files. These binary files were then imported into EEGLAB software for pre-processing stage. Moreover, a band-pass filter between 0.5–60 was applied to remove the effect of other frequencies. In the EEGLAB, we separated the EEG signals of each stage and the obtained signals were saved as dataset files which can be imported into MATLAB. These signals were then transferred into frequency domain by Fast Fourier Transform (FFT) and MATLAB 2013b was used to calculate their power spectrum and power of each sub bands including delta (1–4 Hz), Theta (4–8 Hz), alpha (8–12 Hz), beta (12–28 Hz), and gamma (28–40 Hz).

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Transparency document. Supporting information

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References

[1] M. Jalilifar, et al., Quantitative assessments of extracellular EEG to classify specific features of main phases of seizure acquisition based on kindling model in Rat, Neurosci. Lett. 656 (2017) 144–151.

[2] A. Yadollahpour, M. Jalilifar, Seizure prediction methods: a review of the current predicting techniques, Biomed. Pharmacol. J. 7 (1) (2014) 153–162.

[3] K. Esmaeilpour, et al., Comparing the anticonvulsant effects of low frequency stimulation of different brain sites on the amygdala kindling acquisition in rats, Basic Clin. Neurosci. 4 (3) (2013) 250.

[4] G. Paxinos et al., Chemoarchitectonic Atlas of the Rat Brain, 2009.

[5] A. Yadollahpour, et al., Repetitive transcranial magnetic stimulation decreases the kindling induced synaptic potentiation: effects of frequency and coil shape, Epilepsy Res. 108 (2) (2014) 190–201.

[6] R.J. Racine, Modification of seizure activity by electrical stimulation: II. Motor seizure, Electroencephalogr. Clin. Neurophysiol. 32 (3) (1972) 281–294.