The 2nd International Neuroinflammation Congress and 2nd Student Festival of Neurosience

Shefa Neuroscience Research Center, Tehran, Iran, 17-19 April, 2018

The Neuroscience Journal of Shefaye Khatam

Volume 6, No. 2, Suppl 1

Oral Presentation

Long Term Video EEG (AC/DC) Monitoring

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Published: *17 April, 2018*

Abstract

Long term video electro-encephalographic (EEG) monitoring (LTM) is defined as the continuous and synchronized recording of EEG and multimedia to analyze brain abnormalities. A conventional LTM system continuously records EEG in the frequency range of 0.5-70Hz. The data synchronization, the high-volume data management, the system reliability as well as noise reduction remain significant challenges in an LTM machine. Moreover, online multi-user access to the data during the recording as well as online EEG control remains another essential point. Beyond conventional LTM systems, recent studies indicate the existence of a potentially clinically-relelvant near-DC field potential (f<0.1Hz) among the EEG data. This DC field potential, although sometimes present in healthy subjects, also appears to be associated with a variety of brain abnormalities such as migraines with auras and some types of epileptic activity. Therefore, the EEG frequency range must be extended to include lower frequencies down to 0.01 Hz. The potential asymmetric changes of the bio-electrodes in ultralow frequencies, effects of the scalp - skull structures and its capacitance features, as well as EEG instrumentation, are significant challenges that need to be addressed to provide DC EEG to a conventional LTM machine. We propose a new technique and system to capture and review the AC/DC LTM data. The proposed system aids in analyzing both high and low-frequencies oscillations of brain electrical activities.

Keywords: LTM, EEG, Direct Current

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