MULTI-SCALE ANALYSIS OF EEG SIGNALS IN ALZHEIMER DISEASE USING WAVELET TRANSFORMATION

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Introduction: Wavelet transform is introduced to perform the multi-scale analysis EEG of AD.

Aims: To find multi-scale qualitative characteristics of EEG in AD.

Methods: The EEG records of 30 AD patients and 22 normal controls were analyzed by wavelet transform. Wavelet power spectrum is introduced to evidence multi-scale distribution index of EEG signals. Multi-scale phase averaged waveforms were extracted by wavelet coefficient index using conditional phase averaging technique.

Results: The narrow-band power spectrum with single peak at 1Hz is the typical characteristic of EEG in AD, while normal controls always represent wideband power spectrum having three typical peaks at 0.1Hz, 1Hz, 10Hz (fig.1). The wavelength of phase averaged waveform in AD was longer than normal which means lower frequency in AD (fig.2).

Conclusion: Wavelet transform can reveal significant aspects of EEG in AD. Wavelet power spectrum and the phase averaged waveform are useful quantities in diagnosis and evaluation of AD.