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Abstract
According to the meridian theory and clinical evidences of Chinese medicine, acupoint stimulation utilizing such as manual acupuncture, electrical acupuncture, and massage to acupoints is well-known to have healthcare or therapeutic effects on some diseases. Next, in Western neuroscience medicine, evoked potentials induced through stimulation are also known to be used for checking the state of central nervous system of the human being. Except these evidences, many other studies have been verified that acupoint stimulation has related to the variety of evoked potentials of central nervous system.

Based on the previous viewpoints, this study will develop a system with acupoint electrical stimulation and evoked potentials extraction functions. By this system, we can make such an acupuncture scientific research. The hardware of the system mainly includes two subsystems: (1) an acupuncture-like transcutaneous nerve electrical stimulator (AL-TENS): It can generate biphasic current stimulation waveform and can make five-section manual amplitude adjustment. It also can setup the duration and frequency directly via the developed graphical user interface; (2) an eight-channel EEG frond-end amplifier: It has a filter bandwidth of 0.1-50 Hz and an amplification rate of x13500. Moreover, the system GUI was developed by LabVIEW. It has the functions of real-time time / frequency domain analysis, time control of stimulation and data storage. The stored EEG data then were used for off-line evoked potentials extraction analysis via the EEGLAB software. Totally speaking, the acupoint stimulation and EEG measurement functions of the development system are basically satisfactory.

After completing the system, we utilize it to stimulate some subject’s right hand Huge acupoints and then to examine their SEP. We found that the components of N20 and N80 are similar to the results obtained by a NeuroScan’s machine under the same testing condition. Next, we use a written LabVIEW-based pattern reversal stimulation program and select an Eye acupoint on the ears to stimulate in order to do the study of VEP variety. The results show that the N100, P135 and N160 components of VEP are also close to the test results obtained by the NeuroScan’s machine. Finally, using the Friedman variance analysis we find that the latency of VEP components has not apparent change before and after stimulation to the Eye acupoint of ears.
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