PROTECTION OF ISCHEMIA-REPERFUSION INDUCED CELL DEATH BY NON STEROIDAL ANTI-INFLAMMATORY DRUGS (NSAIDs) IN THE RAT RETINA

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The degeneration of retinal neurons result in loss of vision. it can result from such disorders as central artery occlusion, glaucoma and diabetic retinopathy.
It was known that NSAID can protection of ischemic damage by inhibition of COX activation and other pathway such as oxidative stress, formation of reactive oxygen species.
The present study was performed to investigate the effect of aspirin, sulfasalazine and sulindac in ischemic retina.
Retinal ischemia was induced by high intraocular (at 160 mmHg) for 60 minutes. Drugs were administrated before ischemia right. Protective effect were observed by light microscopy after 24 hrs ischemia. Retinal ischemia induced the degeneration of neurons in ganglion cell layer and inner nuclear layer.
All drugs, aspirin, sulfasalazine and sulindac reduced retinal cell death induced by ischemic reperfusion. Sulindac showed protective effect in low concentration than others. Aspirin and sulfasalazine had the protective effect in between 1 and 5 mM concentration. Sulindac had neuroprotective effect in between 50 and 500 μM concentration.
These results showed that non-steroidal anti-inflamentory drugs of aspirin series can prevent retinal degeneration by ischemia-reperfusion injury.

Key Words: Ischemia, Retina, Aspirin, Sulfasalazine, Sulindac

DEVELOPMENT OF SPEECH PROCESSOR FOR ELECTRICAL STIMULATION ON THE SPIRAL GANGLION NEURON OF THE COCHLEA

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Introduction: The hair cells in the cochlea are responsible for translating mechanical information into neural information. If the hair cells are damaged, the auditory system has no way of transforming acoustic waves to neural spikes. Previous studies reports that deaf individuals lacking hair cells, spiral ganglion neurons are severe degenerated, and that in turn leads to hearing impairment. The purpose of this study is to develop the speech processing system for electrical stimulation through the subcutaneous link.
Method: A microphone that picks up the sound, the sound is first pre-emphasized using an automatic gain controller and passed through a bank of 8 channel bandpass filters. The filtered waveforms are then extracted by RMS-to-DC converter. The outputs are finally compressed and then used to modulate PWM pulses. A non-linear compression function is used to ensure that the extracted signals fit the dynamic range of electrically evoked response.
Results: We report the waveforms of the stimuli [illegible] produced by a speech processing system. The stimuli amplitudes reflect the RMS of the bandpass outputs for each channel. The advantage of this CIS (continuous interleaved [illegible]) type of stimulation is that the pulses are delivered in a non-overlapping fashion, thereby minimizing channel interaction. The transmitter of this system transmits the stimuli through a 2.5 MHz radio frequency.
Conclusion: The developed system is expected to use a non-overlapping pulse generator for electrical stimulation on the spiral ganglion neuron in the cochlea.

Key Words: Cochlea, Hair cell, Spiral ganglion neuron, Speech processor, Hearing