Response changes to pure tone in inferior colliculus of guinea pig after cochlear damage induced by noise exposure

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Cochlear damage by acoustic trauma produces auditory plasticity and hyperactivity; this may be related to the mechanism of symptoms such as noise-induced tinnitus, hyperacusis, and loudness recruitment. To research this progressively, response of guinea pig inferior colliculus neurons (ICN) to pure tone stimuli after cochlear damage induced by noise exposure (1/3 octave narrow band, 4 kHz, 120dB) were observed. One day after noise exposure, double peaked frequency response areas (FRAs) significantly increased, the notches mostly at about 4 kHz and 16 kHz regions, in CF and depth function map, there was an obvious fault corresponding to 4 kHz (noise frequency). Another interesting founding was narrow FRAs increased and the bandwidth at 20 dB above threshold (BW20) at the characteristic frequency (CF) decreased slightly compared to control group. 11-21 days after noise exposure, the percentage of narrow type FRA reduced and average BW20 significantly increased compared to control group. Spontaneous activity increased significantly 11-21 days after noise exposure and appeared at all most frequency regions from 1.9 kHz to 33.8 kHz. All above may have relations with symptoms such as noise-induced tinnitus, hyperacusis, and loudness recruitment. Further research is needed.

Biography
Feng wang, female, MD, associate professor, vice-director in Department of Otolaryngology, The First Affiliated Hospital of Chinese PLA General Hospital, Beijing, China. She earned her bachelor s degree (1991) in Inner Mongolia medical college, Chinese, earned her master s degree (2000) and doctors degree (2010) both in Chinese PLA General Hospital and Chinese PLA medical college. She has Otolaryngology experience for over 20 years, especially skilled in surgeries such as septo-rhinoplasty under endoscopy, UPPP, endoscopic surgery in treating chronic sinusitis. During 1997~1999, she researched on“effect of nitric oxide (NO) on ciliary beat frequency (CBF) in human nasal mucosa” and found that NO can enhance the CBF in chronic sinusitis nasal mucosa immediately. From 2008 to nowadays, she began to research on“Response changes to pure tone in inferior colliculus of guinea pig after cochlear damage induced by noise exposure”.

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