Nicotine impact on the structure of adult male guinea pig auditory cortex


Abstract:

BACKGROUND: A growing body of evidence suggests that chronic cigarette smoking causes detrimental effects on brain morphology. AIM OF WORK: To study the structural changes in auditory cortex region (Layer V), under the influence of nicotine. MATERIAL AND METHODS: Three animal groups (10 each) were used; group I (control) and groups IIa and IIb received 3 and 6mg/kg nicotine respectively. The specimens from the auditory cortex were examined using light and electron microscopy and morphometry. RESULTS: Neurons and blood capillaries of the auditory cortex (layer V), were influenced by chronic nicotine treatment in a dose dependent manner. The neurons and their processes revealed disorganization and dissociation of microtubules. The neuronal cells nucleoli characteristically revealed large fibrillar centers detected by silver stain and ultrastructure. The blood capillaries revealed collapse, irregular lumen, thickened basal lamina, abnormal forms of nuclei and organization of microtubules. Neuroglia revealed marked reactivity. Morphometrically, there was a significant decrease in the thickness of the auditory cortex and the number of light neurons and a significant increase in the number of dark neurons in comparison to the control. CONCLUSION: Nicotine affects the integrity of the auditory cortex possibly by reducing metabolic and transcription activities.

Keywords:

Auditory cortex; Guinea pig; Nicotine; Ultrastructure

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