

LONG-TERM EFFECTS OF 3-ACETILPYRIDINE-INDUCED DESTRUCTION OF CEREBELLAR
CLIMBING FIBERS ON PURKINJE CELL INHIBITION OF VESTIBULOSPINAL TRACT
CELLS OF THE RAT

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The effect of climbing fibers deafferentation on Purkinje cell inhibition of rats was studied by intracellular recording. In the present study, 3-acetylpyridine (3-AP) was used to destroy the inferior olive. The inhibitory postsynaptic potentials (IPSPs) of vestibulo-spinal tract (VST) cells induced by cerebellar stimulation was examined at 10 day intervals up to 160 days after 3-acetylpyridine intoxication. There were 4 basic changes in monosynaptic inhibitory potentials. First, the rate of IPSP occurrence among VST cells was 0.64 in control rats, at more than 10 days after 3-AP intoxication, it declined gradually, down to 0.37-0.38 at 70-81 days, thereafter increased to 0.53 by the 160th day. Second, the size of IPSP was smaller on and after day 10. Third, the latency of IPSP was prolonged by 0.25 msec. on and after day 10. Fourth, the cerebellar threshold for evoking IPSP was increased after 3-AP intoxication. Thus climbing fiber deafferentation exerts longterm influence on excitability of Purkinje cell axons, and connectivity and synaptic transmission from Purkinje cell axons to VST cells.