

EEG CHARACTERISTICS IN VARIOUS SPECIES OF ANIMAL AND THEIR RELATION TO THE CNS-EFFECTS OF DRUGS. Ken-ichi Yamamoto*, Tohru Sawada, Yukio Naito and Shizuo Utsumi. Shionogi Research Laboratory, Osaka.

Electroencephalographic and behavioral studies have been carried out in several species of animal with chronically indwelling brain electrodes for the neuropharmacological analysis of sleep mechanisms and for the estimation of the sites of action of CNS-affecting agents.

1. Differences in the normal EEG pattern and sleep-wakefulness cycles among the six species of animal: From the correspondence between EEG and behavior, normal EEG levels were classified into three levels in rats, five levels in rabbits, six levels in cats and dogs, and seven levels in monkeys. Every EEG level was distributed over the 24 hour EEG tracing for cats; rats showed an increase of sleeping states in the daytime; dogs, and particularly monkeys, were more wakeful in the daytime.
2. Electroencephalographic species specificity for CNS-affecting agents: No species specificity was observed among the animals with reserpine and barbiturates. Benzodiazepines, chlorpromazine and morphine caused continuous sedateness and sleeping in dogs and monkeys, less slow waves in cats.
3. Differences in EEG pattern between acute and chronic animals after identical doses of CNS-affecting agents: Stable slow waves were elicited by benzodiazepines and morphine in flaxedil-immobilized acute cats; but characteristic arousal patterns were caused by the same doses of the agents in chronic cats.
4. Dissociation between EEG and behavior: Some kinds of phenothiazine derivatives and anticholinergic agents elicited stable slow waves and spindle bursts with eyes-opening behavior; at a surgically narcotic level, ether caused a desynchronized pattern.

ELECTROENCEPHALOGRAPHIC EFFECTS OF Δ^9 -TETRAHYDROCANNABINOL, LSD-25, MESCALINE AND 2,5-DIMETHOXY-4-METHYLAMPHETAMINE IN THE RABBITS. Shigenori Watanabe*, Hiroyoshi Nishi, and Showa Ueki. Department of Pharmacology, Faculty of Pharmaceutical Sciences, Kyushu University.

The EEG effects of Δ^9 -tetrahydrocannabinol (THC), LSD-25, mescaline and 2,5-dimethoxy-4-methylamphetamine (DOM) were investigated in unanesthetized unrestrained rabbits with chronic electrode implants. THC, in doses of 1-5mg/kg i.v., caused a marked increase in high voltage slow waves in the spontaneous EEG of the neocortex, although the animals were rather hyper-irritable without showing drowsiness in behavior. The change in the hippocampal EEG was the most characteristic; i.e., the synchronized theta waves were markedly decreased only in voltage by THC, without being desynchronized. DOM, in doses of 0.1-0.5mg/kg i.v., changed the EEG in all brain areas to an arousal pattern, simultaneously with behavioral arousal. Mescaline, in a dose of 50mg/kg i.v., invariably caused a typical arousal pattern in the spontaneous EEG. LSD-25, in doses of 20-100 μ g/kg, decreased the voltage of the EEG in all brain areas. The EEG arousal response to either auditory or mesencephalic reticular stimulation was slightly depressed by THC, but was unaffected by LSD-25. The effects of DOM and mescaline on the arousal responses were unable to be determined, because of the continued EEG arousal pattern induced by these drugs. The photic driving response elicited by flashlight of 3-8Hz in the visual cortex was suppressed by THC but not influenced by DOM and mescaline. The recruiting response elicited by electrical stimulation of the centromedian thalamic nucleus was increased in voltage by THC, but slightly inhibited by the other drugs. The hippocampal afterdischarges were slightly increased in duration by DOM, mescaline and LSD-25, but not altered by THC.