

Neuroscience-2021: Alteration of GABAergic neurotransmission- Anwar SATEF- University of Hassan 1st, Morocco

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Abstract

Alteration of GABAergic neurotransmission in the central nervous system is involved in the generation of neuronal hyperexcitability and seizures. GABAergic transmission blocked by GABA antagonists injected i.p. intracerebrally induce seizures. In the present study, we characterize the effect of an inhibitor of glutamate decarboxylase, the enzyme responsible of the synthesis of GABA by injection of different doses of (TSC). Eight groups of six wistar rats were selected for behavioral assessment, seizure scoring, reactivity to sound and antiepileptic substances efficiency. The dose of 2,5mg/kg did not induce noticeable behavioral reaction whereas 5mg/kg induce a significant reduction in rearing and grooming. However, this reduction was reversed at the dose of 7,5mg/kg and 10mg/kg. tonico-clonic seizure induction appeared at the dose of 7,5mg/kg with an incidence of 7,69% and a latency of 75 min. the incidence and the severity of seizures increased with the doses 10mg/kg and 20mg/kg whereas the latencies decreased. At 20mg/kg, status epilepticus and death were observed. Interestingly, audiogenic seizure (AG) susceptibility was elicited with the dose of 7,5mg/kg. AG included wild running fits followed by tonic seizure. Phenobarbital (PB) (30mg/kg), Phenytoin (PH) (30mg/kg) and valproic acid (VA) (200mg/kg) inhibited tonico-clonic seizures elicited by 10mg/kg of TSC. PB resulted in 100% inhibition in minimal and maximal seizures. PH and VA reduced maximal seizures by 65,73% and 80,25% respectively

inhibition of GABAergic neurotransmission resulted in appearance of behavioral changes indicating anxiogenic effect then minimal tonico-clonic seizures followed by maximal tonico-clonic seizures and at the high inhibition status epilepticus and death. First generation of antiepileptic substances were efficient to reduce both minimal and maximal seizures. It is important to note that the dose of 7.5 mg / kg which does not induce convulsive seizures induced susceptibility to audiogenic epilepsy Statistically significant ($p < 0,05$).

for minimal seizures, PH and VA induced similar reduction (46,16% and 44,42%) ($p < 0.05$). Gradual