DCEBIO INHIBITS EXCITABILITY OF MICE TRIGEMINAL NOCICEPTORS: A NEW PHARMACOLOGICAL APPROACH AGAINST MIGRANE

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Background. Migraine represents a neurovascular disorder that affects about 15% of the general population, and a pharmacological therapy is currently unsatisfactory. We have studied the effects of DCEBIO on the excitability of mouse trigeminal nociceptors that are centrally involved in the migraine pain, with the aim to find a new therapeutic approach to this disease.

Methods. Electrophysiological recordings in adult mouse trigeminal (TG) neurons were performed by patch-clamp technique in whole cell configuration both in current and voltage clamp configuration to study the effect of DCEBIO on excitability and TTX-r voltage gated sodium currents. Excitability was studied by applying hyperpolarizing and depolarizing current pulses from the resting membrane potential, whereas the TTX-r sodium currents were studied under voltage clamp and TTX in the bath, with protocols suited to define the activation and inactivation properties. Neurons of small diameter (< 20 μm) and responsive to capsaicin were selected, and taken as nociceptors.

Results. DCEBIO inhibits TG nociceptor excitability in that it increases the current needed to evoke action potentials firing (rheol current), and decreases the number of action potentials (nAP) evoked at 1.5 X rheol current. Given the critical role of the TTX-r sodium currents in the excitability of nociceptors, we investigated the effects of DCEBIO on this current. DCEBIO was found to modify dramatically this current, shifting the steady state activation and inactivation properties in the depolarizing (6 mV) and hyperpolarizing (17 mV) direction, respectively.

Conclusions. Our study indicates that DCEBIO could represent a potential tool to develop a new pharmacological approach to migraine. This application is further emphasized by the absence of side effects of DCEBIO demonstrated through in vivo studies.