Polypharamocological drugs in the treatment of epilepsy: The comprehensive review of marketed and new emerging molecules

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The researchers in the laboratory of Dr. Manisha Tiwari have recently reviewed "Polypharamocological Drugs in the Treatment of Epilepsy: The Comprehensive Review of Marketed and New Emerging Molecules".

In this article, they have comprehensively discussed the role of polypharmacological drugs for the therapy of epilepsy. A comparable effect of polypharmacological drugs versus single-targeted drugs has also been discussed in detail. As we know epilepsy is a chronic neurological disorder having complex pathophysiology involving various enzymes, receptors and ion channels. The currently used antiepileptic drugs (AEDs) predominately target voltage-gated ion channels (Na+, Ca2+ and K+), GABAA receptor, glutamate receptor, synaptic vesicle 2A protein and carbonic anhydrase. One group of AEDs acts on a single target while another group acts via multiple targets to control seizure episodes. AEDs which act via multiple mechanisms or polypharmacological mechanisms of action have appeared as broad spectrum anticonvulsant agent and therefore, they provide a better choice to clinicians to manage drug-resistant epilepsies and various other epileptic syndromes.

For example, polypharmacological AEDs such as Phenobarbitone, Valproic acid, Oxcarbazepine, Felbamate, Topiramate, Gabapentin, Retigabine, Safinamide, Seletracetam, Fluorofelbamte, Carisbamate etc. are vital for managing epilepsy successfully, since decades. These

polypharmacological drug treatment for epilepsy could be a better choice for management of various classes of seizures as compare to single target AEDs which may be effective in a limited class of seizures.

Many studies have shown that multi-targeted AEDs also reducedepression, anxiety, mood disorders, cognitive deficits and suicidal rates besides stopping seizure episodes, which leads to improvement of quality of life. Moreover, some of these polypharmacological drugs effectively cure more complex forms of epilepsy such as Lennox- gastaut syndrome, Rasmussen syndrome and status epilepticus. The detailed discussion in this review on polypharmacological AEDs may open a new avenue for discovery and development of more potentantiepileptic drug which prove better therapeutic regimen for epilepticpatients. So, in this race "polypharmacological drugs" stands out first for the treatment of epilepsy in comparison to single targeted antiepileptic drugs.

More information: Shikha Kumari et al, Polypharmacological Drugs in the Treatment of Epilepsy: The Comprehensive Review of Marketed and New Emerging Molecules, *Current Pharmaceutical Design* (2016). DOI: 10.2174/1381612822666160226144200

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