COMPARATIVE EFFICACY OF ANTIEPILEPTIC DRUGS IN CHILDREN AND ADOLESCENTS: A NETWORK META-ANALYSIS

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Background Only limited information on the efficacy of antiepileptic drugs (AEDs) in the treatment of paediatric epilepsy is available due to the small number of randomized clinical trials (RCTs). We conducted a network meta-analysis (NMA) in order to estimate the comparative efficacy among AEDs.

Methods Using the EMBASE and MEDLINE databases, we updated to February 2017 the search strategy of the National Institute for Health and Care Excellence guidelines for epilepsy. We included only RCTs conducted in children and mixed-age populations. Three investigators independently selected articles and used the Cochrane risk-of-bias tool to assess study-level quality. The efficacy outcome was considered to be seizure freedom or ≥ 50% seizure reduction. The protocol is registered with PROSPERO, number CRD42015024920.

Findings Forty-six RCTs were selected. A total of 5652 individuals were randomized to 22 AEDs and placebo. The point estimates of carbamazepine and lamotrigine efficacy showed their superiority with respect to all comparator AEDs for the treatment of newly-diagnosed focal epilepsy. In refractory focal epilepsy, levetiracetam (Odds Ratio-OR- 3.3, 95% Credible Interval-CrI- 1.3-7.6) and perampanel (OR 2.5, 95% CrI 1.1-5.8) were statistically more effective compared to placebo. Ethosuximide and valproic acid were both superior to lamotrigine in the treatment of absence seizures. The OR point estimate showed the superiority of adrenocorticotropic hormone over all comparators in infantile spasms.

Interpretation This NMA shows the need to improve the quality of studies through the use of comparative designs, relevant outcomes, appropriate follow-up and more reliable inclusion criteria.