Electroconvulsive Therapy (ECT) in Children With Autism: A Systematic Review of the ECT Practice and Anesthesia Approach to this Emerging Therapy

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Objective: Electroconvulsive therapy (ECT) has long been used for a multitude of refractory psychiatric conditions. In recent years, the potential therapeutic benefits of this re-emerging modality have been explored in child and adolescent patient populations. Administration of ECT in children requires careful planning, and pediatric anesthesiologists play an integral role in providing safe administration of anesthesia and analgesia throughout the procedure.

Literature demonstrating safe and effective anesthesia for pediatric patients undergoing ECT is minimal and extrapolated primarily from adult studies. However, special consideration must be given to children undergoing ECT. The aim of this systematic review was to examine the current use of ECT in pediatric patients with autism and gain insight into the current anesthesia practices performed for this procedure.

Methods: In conjunction with the department of Child and Adolescent Psychiatry at our institution, we performed a systematic review of available databases (Cochrane, Embase, and Pubmed) to evaluate available information on ECT in children with autism. Cases in languages other than English, as well as those with persons over the age of 18, were excluded from analysis; 22 cases met inclusion criteria, spanning from 1999 to 2015.

Results: Of the 22 cases, all of the children who underwent ECT were between the ages of 8 and 17 with a mean of 14.86 years; 73% were male. All of the children were on the autism spectrum. 91% of children had comorbid diagnoses, which included: catatonia (82%), mood disorder with psychosis (14%), bipolar disorder (14%), major depressive disorder (5%), schizophrenia (5%) and Tourette’s syndrome (5%). Prior to qualifying for ECT, these children had failed multiple conservative treatments, often being treated with multi-drug regimens: 1st and 2nd generation antipsychotics (42.1% and 63.2%, respectively), SSRIs (61.9%), monoamine oxidase inhibitors (4.8%), tricyclic antidepressants (14.3%), benzodiazepines (60%), stimulants (23.8%) and mood stabilizers/anticonvulsants (60%) (Total > 100% secondary to polypharmacy). 86% were bilateral ECT treatments, and 14% were unilateral ECT. Children received between 10 and 156 ECT administrations. The treatments were overall well tolerated with few side effects, which were reported as: fatigue, hunger, and emergence agitation.

A general anesthetic technique was utilized in all of the reported cases: Induction agents included propofol (9% total cases), methohexital (55% total cases), 36% unreported. Neuromuscular blockers (NMB) included succinylcholine (59% total cases), 41% unreported. Anticholinergic agents included glycopyrrolate (32% total cases), 68% unreported. No adverse events were reported. NPO time was not mentioned. The most common medication combinations used were methohexital and
succinylcholine. Airway management consisted of simple mask ventilation at FiO2 of 100% prior to initiation of the electrical stimuli. ECT-induced seizures lasted from 26-206 seconds as measured by EEG. None of the cases reported patients requiring intubation or experiencing any unanticipated airway events such as laryngospasm or oxygen desaturation.

Conclusion: The majority of ECT performed in children is done on adolescent patients with chronic mental illness who have not improved with oral medication. The response to electroconvulsive therapies in this population has been promising as measured by the following parameters: improvement of self-injurious behavior, reversal of catatonia, ability to return to school, ability to engage in play activities, and reduction in aggressive behavior. The procedure itself appears to be well tolerated by those undergoing treatments.

As such, pediatric anesthesiologists should be aware that ECT in the pediatric population may be utilized more frequently. Based on these cases, it appears that ECT has been safely administered to this population; however, further study on the safety and efficacy of anesthesia technique is warranted. Not mentioned in these reported cases were use of accepted NPO recommendations or the consideration of the potential for pharmacologic interaction of psychotropic drug regimens with anesthetic drugs. Succinylcholine was the most frequently used NMB in these patients. Education must be provided to practitioners and to families with children who will be undergoing ECT with regard to potential drug interactions, the use of succinylcholine in pediatric patients, and potential airway complications that may arise with the use of potent anesthetic medications throughout electroconvulsive therapy. The relative lack of studies in the anesthesia literature makes ECT in the pediatric population a potential area for future focus.