

CLiPPs

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CLiPPs (Current Literature in Pediatric Psychosomatics) is a pertinent article review from a range of medical science journals and literature from the AACAP Physically Ill Child Committee for consultation/liaison psychiatrists.

Stayed tuned for our CLiPPs reviews being featured in JAACAP Connect courtesy of some great advocacy work by Dave DeMaso, Maryland Pao, and myself. There will be 3 reviews featured in the inaugural CLiPPs section of the upcoming JAACAP Connect issue. Stay tuned and keep your eyes peeled!

We are excited to present our 9th edition, an issue representing another diverse array of inpatient and outpatient C-L concerns: a systematic review of re-evaluated psychiatric symptoms and diagnoses after pediatric epilepsy surgery, a study of psychotropic usage in parents of children who have had cancer, a prospective study of pediatric delirium in cardiac bypass patients, and a trial of hypnosis on mediating the experience of VCUGs.

Do behavior and emotions improve after pediatric epilepsy surgery? A systematic review

Background: Children with epilepsy are more likely to have behavioral and emotional problems than children in the general population and children with other chronic illnesses. Epidemiological studies have shown increased risk of autism spectrum disorder, ADHD, anxiety disorders, and depression^{1,2}. There is a suggestion that behavior problems are worse in children with more severe epilepsies. The psychiatric problems in children with epilepsy may be due to a common underlying disorder, behavioral problems may be the results of abnormal epileptiform discharges, adverse effects of anti-seizure medications, or psychosocial reactions to having seizures. Seizure surgery is an option for intractable focal seizures and may result in complete control of seizures in appropriately selected cases. Quality of life improves if seizures are controlled, but the evidence for improvement in behavior is more limited.

Methods: Reilly et al. conducted a systematic review of emotional and behavioral status before and after epilepsy surgery. Inclusion criteria were age 0-17 years of age, at least 10 patients in the series, and pre-and post-surgical assessment of behavior with validated measures or evaluation for a DSM diagnosis.

Results: Only 15 of 104 studies met inclusion criteria. Behavioral problems were reported in 52-83% of children. Dimensional measures, most often the CBCL, showed improvement of at least one behavioral or emotional problem in 7 of 9 studies and no worsening of behavior in any study. Behavioral improvement occurred when seizure surgery resulted in reduced seizure frequency. There were no other predictors of behavioral improvement. In contrast, there was no change in the number of children with a DSM diagnosis after seizure surgery compared to before surgery.

Conclusion/Commentary: There may be some improvement in behavior after seizure surgery, but children remain at risk for a psychiatric diagnosis. There are several limitations to this review: The number of studies is low, most studies utilized parent reports and not child or teacher reports, and very few studies assessed duration of epilepsy, age at the time of surgery, or cognitive function as predictors of the outcome.

Take-away: Behavioral and emotional functioning should be assessed prior to and after seizure surgery in children and adolescents. Because of the frequency of psychiatric problems, assessment should be a standard part of a comprehensive epilepsy evaluation. Improvement in seizure control is associated with improvement in behavior but many children continue to meet criteria for a psychiatric diagnosis. Additional studies are needed to determine factors significant in behavioral outcome of pediatric epilepsy surgery.

References:

1. Russ SA, Larson K, Halfon N. A national profile of childhood epilepsy and seizure disorder. *Pediatrics*. 2012; 129: 256-264.
2. Reilly C, Atkinson P, Das KB, et al. Neurobehavioral comorbidities in children with active epilepsy: a population-based study. *Pediatrics*. 2014, 133: e1586-e1593.

Reviewer: David W. Dunn, MD, Indiana University School of Medicine

Source: Reilly C, Baldeweg T, Stewart N, Wadhvani S, Jones C, Cross JH, Heyman I. Do behavior and emotions improve after pediatric epilepsy surgery? A systematic review. *Epilepsia*. 2019; 60: 885-897. [Link here](#)

Psychotropic Medication Use in Parents of Children Diagnosed with Cancer

Background: While childhood cancer has an overall survival rate >80%, their parents may continue to struggle emotionally beyond treatment completion.¹ Objective measures to assess parental distress are limited. Emotional support is often not universally available to these families, and recent reviews

have differing results on the long-term adverse psychological impact.^{2,3} This study aimed to better characterize the needs of affected parents through a population-based retrospective cohort study of the incidence of psychotropic medication initiation.

Methods: Information was obtained on all antidepressant, anxiolytic, and hypnotic prescriptions since 1995 from the Danish National Prescription Registry (DNPER). Cohorts were identified for examining the incidence of psychotropic use based on the child's cancer status and independent parental risk factors. 7821 biological parents of children <20 years old diagnosed with cancer between 1998 and 2014 were identified using the Central Population Registry (CPR). Parents with psychotropic prescriptions 1-3 years prior were excluded, resulting in reduction to 6744 parents. A comparison group of cancer-free children with matching birth years was chosen randomly in a 1:10 ratio, resulting in 65,747 parents.

For examining independent contributing parental factors, with similar exclusion criteria, 3290 parents of children with cancer were identified, however those children were <15 years old, and did not capture 16-19 year olds as the above cohort. An additional parent cohort of children with cancer, Childhood Cancer Registry (CCR), was queried for the years 2003-2015. This allowed for gathering information between 3 main diagnostic cancer groups and whether the child survived. Sociodemographic information for parents was obtained through the Civil Registration System (CRS) correlating to the diagnosis or index date, as well as 1 year prior. Parents were followed from cancer diagnosis until the first prescription, death, emigration, or June 30, 2015, whichever came first. Statistical analyses were presented as hazard ratios.

Results: Parents of children with cancer had a 4% increased incidence of psychotropic medication prescription after 3 years. During the first year after diagnosis, there was increased rate of a first prescription across all 3 medication categories, with significant increase in the rate of anxiolytics and hypnotics. There was no statistically significant difference according to cancer type, however relapse and death of a child did increase use of medication. Influencing sociodemographic factors included lower education, lower income, and younger parents.

Conclusion/Commentary: It may not be surprising that there is more frequent use of psychotropic medications for hypnotics and anxiolytics amongst parents of children with cancer. The study suggested stress and anxiety-related symptoms may be more prevalent in this population than depression severe enough to require use of psychotropics. Previous studies have consistently demonstrated the presence of elevated anxiety and depression, though longer-term post-traumatic stress disorder is less consistently appreciated, suggesting that the impact of psychological distress can decrease with time.

Interestingly, there does not appear to be a correlation with cancer type, and therefore treatment protocols, and use of psychotropic medication. This implies that any experience as a parent of a child with cancer can have impact. As expected, relapse and death of a child confer increase incidence of psychotropic medication use, as well as certain factors that may limit resilience.

Limitations of this study include using prescription data as an indicator of psychological distress. Surveillance bias can not be excluded, and prescriptions have only been registered since 1995. This

paper also frequently utilized the word “risk” to describe the rates of medication use. This review elected to describe rate use in terms of “incidence”, as “risk” could imply parents of children with cancer receiving mental health treatment as a negative.

Take-aways: Education of medical professionals regarding the emotional needs of parents whose child have cancer is essential to adequately anticipate and assess for the stress response of the whole family. This study highlights the importance of further research to develop effective parental and family interventions.

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1. Teliarova-Foucher E, Columbet M, Ries LAG et al; IICC-3 Contributors. International incidence of childhood cancer, 2001-10: a population-based registry study. *Lancet Oncol*. 2017;18(6):719-731.
2. Kearney JA, Salley CG, Muriel AC. Standards or psychosocial care for parents of children with cancer. *Pediatr Blood Cancer*. 2015;62(suppl 5):S632-83.
3. Ljungman L, Cernvall M, Gronqvist H, Ljotsson B, Ljungman G, von Essen L. Long-term positive and negative psychological late effects for parents of childhood cancer survivors: a systematic review. *PLoS One*. 2014;9(7):e103340.

Reviewer: Roslyn Gerwin, DO, Maine Medical Center

Source: Salem H, et al. Psychotropic medication use in parents of children diagnosed with cancer. *Pediatrics*. 2019;143. [Link here](#)

Delirium after Pediatric Cardiac Bypass Surgery

Introduction: Delirium is a syndrome commonly seen in critically ill children characterized by fluctuation in mental status, attention and disorganized thinking. Post-cardiotomy delirium is defined as subset of delirium that happens subsequent to cardiac bypass surgery. It has been found to be associated with increased risk of mortality, increased risk of stroke, increased rate of readmission and substantial cognitive dysfunction at age 1 year following surgery. Incident of delirium in children after cardiac bypass surgery has never been systematically studied. The primary objective of this study was to evaluate children admitted to the pediatric cardiothoracic intensive care unit immediately after cardiopulmonary bypass surgery to assess for delirium and determine risk factors. A secondary objective of the study was to assess the effect of delirium on short term outcome measures including length of stay and time on mechanical ventilation.

Materials and Methods: This study was conducted at Cornell Medical Center between December 2014 and August 2015 in the 14-bed pediatric cardiothoracic intensive care unit. Cornell assessment of pediatric delirium (CAPD) tool has been validated for use in children ages 3 months to 21 years of age and uses the DSM-V criteria to screen for delirium. CAPD has also been found to discriminate between delirium and other causes of altered mental status in critically ill children. The CAPD was completed at

least once a day by the bedside nurse starting the day of bypass. A CAPD score of 9 or higher was considered diagnostic for delirium in developmentally typical patients, as fits with the validation studies. For developmentally delayed patients to be diagnosed with delirium, the study required both the CAPD score of 9 or higher and confirmation of change from neurological baseline by an intensive care unit practitioner. Nursing staff received education on delirium screening prior to the study. The pediatric index of mortality 2 scale was used to determine severity of illness upon admission to the pediatric cardiac intensive care unit.

Results: 194 patients were enrolled and a total of 1342 patient days were evaluated of which 380 were delirious days. The incidence of delirium was found to be 49% with a median of 2 delirious days per patient and delirium developing within the first 3 days after surgery. 47% of patients developed delirium on the 1st day. Half the patients were less than 2 years of age, and 16% were developmentally delayed. Cyanotic heart disease was identified in 44% of patients. 37% were mechanically ventilated. Some of identified risk factors were age under 2 years of age, cyanotic heart disease, developmental delay, and a baseline albumin less than or equal to 3 mg/dL ($p=0.028$). Longer bypass time was also associated with development of delirium. Children who were physically or pharmacologically restrained using opiates and/or benzodiazepines were more likely to be delirious. Delirium was also associated with a longer medium length of stay and total number of days mechanically ventilated.

Conclusion/Commentary: In this study nearly half of the patients developed delirium after cardiac bypass surgery which is consistent with rates in adults and was significantly higher than rates of delirium reported in general population of critically in children. A diagnosis of delirium was also associated with a 60% increased length of stay in the intensive care unit even though length of delirium was only 1-2 days. This study also suggests that children with poor nutrition as well as atypical brains are at higher risk for developing delirium.

Take-away: Delirium is a frequent but under recognized problem in children with cardiac bypass surgery. This study highlights the need for prompt screening and early intervention for children undergoing cardiac bypass surgery.

References:

1. Brown CH. Delirium in the cardiac surgical ICU. *Curr Opin Anaesthesiol*. 2014; 27(2): 117–122.
2. Traube, C., Silver, G., Kearney, J., et al. Cornell Assessment of Pediatric Delirium: a valid, rapid, observational tool for screening delirium in the PICU*. *Crit Care Med*. 2014; 42(3), 656–663.

Reviewer: Aniruddh P. Behere MD, Helen DeVos Children's Hospital/ Michigan State University, Grand Rapids, MI

Source: Patel AK, Biagas KV, Clarke EC, et al. Delirium in Children After Cardiac Bypass Surgery. *Pediatr Crit Care Med*. 2017 Feb;18(2):165-171. [Link here](#)

Hypnosis reduces distress and duration of an invasive medical procedure for children

Background: Voiding cystourethrography (VCUG) is a potentially frightening and painful radiologic procedure that requires children to be alert and cooperative. This study utilized hypnosis-guided relaxation and assessed for a reduction in distress and the procedure time for children receiving the procedure.

Methods: Forty-four children (female: 66%) were randomized to receive hypnosis (n = 21) or routine care (n = 23) while undergoing the procedure. The sample included 72.7% White, 18.2% Asian, 4.5% Latino, 2.3% Black, and 2.3% Filipino, and the mean age was 6.54 years old. Participants had undergone previous VCUGs averaging around 3 procedures each and needed to have experienced distress to meet the eligibility criteria of the study. Age at first VCUG was 4 years or older. The initial assessment included degree of crying, fear, and pain the participants had experienced during their most recent VCUG. Parents completed a series of parallel questions. The participants were given a 1-hour training session in self-hypnotic visual imagery by a trained therapist after the initial assessment, and both the parents and the children were instructed to practice using the imaginative self-hypnosis procedure several times a day in preparation for the upcoming procedure. The therapist was also present during the procedure to conduct similar exercises with the child. The routine care control group chose to participate in a hospital-provided recreation therapy program that included demonstration of the procedure with dolls, relaxation and breath work training, and assistance during the procedure. Fearfulness of both the child and the parent before the procedure was assessed with recorded observational ratings of the child's emotional tone and behavior during the procedure. Immediately after the VCUG, the child was asked about crying, fear, and pain experienced during the procedure, and the parent rated the child's experience on the same dimensions as well as how traumatic the procedure had been for themselves. Finally, the medical staff rated the degree of procedural difficulty.

Results: Results indicated significant benefits for the hypnosis group compared with the routine care group. As compared with their previous VCUG procedure, the group using hypnosis experienced less parent perceived trauma ($p=0.03$), lower level of distress ($p=0.01$), decreased difficulty of conducting the procedure by the medical staff ($p=0.03$), and a significantly shorter procedural time by almost 14 minutes (35.30 vs 49.22 minutes; $p=0.002$). All four effect sizes were moderate to large, 0.56 to 0.86.

Conclusion/Commentary: This study showed hypnosis to be effective in reducing stress for children and their parents in undergoing an invasive medical procedure. Additionally, VCUG total procedure time was reduced by 30% with use of hypnosis. There are well-documented benefits of hypnotic interventions in the medical literature for a wide-range of disorders such as the management of chronic pain, procedural anxiety, procedural pain, functional gastrointestinal conditions, chemotherapy, asthma, burns, etc.¹⁻⁴. Children are more easily hypnotized than adults, and hypnosis as an intervention responds to the general developmental needs of children by addressing their ability

for fantasy and imagination. Self-hypnosis may play an important role as an adjunct therapy in cognitive behavioral treatment and family therapy, as well ⁵.

Take-Away: Relaxation training using hypnosis has the potential to benefit children who undergo other painful or anxiety-provoking medical procedures and improve procedural efficiency.

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1. Weisberg MB. 50 years of hypnosis in medicine and clinical health psychology: a synthesis of cultural crosscurrents. *Am J Clin Hypn*. 2008;51(1):13-27.
2. Palsson OS, van Tilburg M. Hypnosis and Guided Imagery Treatment for Gastrointestinal Disorders: Experience With Scripted Protocols Developed at the University of North Carolina. *Am J Clin Hypn*. 2015;58(1):5-21.
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Reviewer: Khalid Afzal, MD, DFAACAP. University of Chicago.

Source: Butler LD, Symons BK, Henderson SL, Shortliffe LD, Spiegel D. Hypnosis reduces distress and duration of an invasive medical procedure for children. *Pediatrics*. 2005 Jan;115(1):e77-85. [Link here](#)

CLiPPs Feedback

We appreciate any feedback for our young, developing review series.

CLiPPs is edited by Chase Samsel, MD, Boston Childrens Hospital and Dana-Farber Cancer Institute, Harvard Medical School, Boston, MA 02115. All critical summaries are written by the designated reviewers.

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