Hunter Nelson Sturge-Weber Center at Kennedy Krieger Institute

Research Update 2023

TWENTY YEARS!

The Sturge-Weber Syndrome Center at Kennedy Krieger celebrates 20 years in 2023! In 2003, the staff consisted of 13 providers. In 2023, we have 19 team members including providers and research assistants and numerous collaborators at other institutions. In 2005, our name changed to the Hunter Nelson Sturge-Weber Syndrome Center in honor of an inspirational young patient, Hunter Nelson, and the deep commitment from his family and friends to raise funds for SWS research. A lot has changed in 20 years but one thing remains the same: the team's relentless commitment to discovering the best treatments and providing exceptional care for patients with SWS.

PAPER SUMMARY: From our group 2023

Retrospective analysis of presymptomatic treatment in Sturge-Weber syndrome. Annals of Child Neurology Society. 2023 Dec. Ninety percent of infants with Sturge-Weber syndrome (SWS) brain involvement have seizure onset before 2 years of age; this is associated with worse neurologic outcome. Presymptomatic treatment (treating patients before the onset of seizure symptoms) may delay seizure onset and improve outcome, as has been shown in other conditions with a high-risk of developing epilepsy.

This two-centered (Boston Children's Hospital and Kennedy Krieger Institute) retrospective study analyzed records and clinical data from patients with SWS brain involvement. Of the 92 patients included, 32 received presymptomatic treatment (low dose aspirin or low dose aspirin and anti-seizure medication). The data showed presymptomatically-treated patients were more likely to be seizure-free at 2 years. In addition, the current study results indicate that neurologic status at two years of age may be better in those who were presymptomatically treated, as compared to children with SWS brain involvement receiving standard, post-symptomatic treatment; this has not been previously reported. While long term cognitive, epilepsy, and neurologic data is still needed in these patients, the data reported here supports offering presymptomatic treatment to patients with extensive SWS brain involvement.

Presymptomatic treatment is a promising approach to children diagnosed with SWS prior to seizure onset. Further study is needed but this information is a big step forward.

Genetic testing in the evaluation of individuals with clinical diagnosis of atypical Sturge-Weber syndrome. American Journal of Medical Genetics. 2023 Apr. Findings from a recent study of 12 individuals with atypical clinical characteristics suggest patients who present with these atypical characteristics may have variants in genes other than GNAQ (the main gene affected by SWS). This new knowledge is very important as it identifies a subset of patients who will benefit from genetic testing and provides a new recommended work flow for clinical care of babies born with a facial port-wine birthmark.

Cannabidiol treatment for neurological, cognitive and psychiatric symptoms in Sturge-Weber syndrome. Pediatric Neurology. 2023 Feb. A prior drug trial of cannabidiol for treatment-resistant epilepsy in patients with Sturge-Weber syndrome (SWS) implicated improvements in neurological, quality of life, neuropsychologic, psychiatric and motor outcomes.

Ten subjects with SWS brain involvement, controlled seizures and cognitive impairments received the study drug in this prospective drug trial. Oral cannabidiol was taken for six months. SWS neuroscore, port-wine birthmark score, quality of life and adverse events were recorded every four to 12 weeks. Neuropsychologic, psychiatric and motor assessments were administered at baseline and six months' follow-up. Most evaluations were conducted virtually due to the COVID-19 pandemic.

Cannabidiol was generally well tolerated. Six subjects reported mild to moderate side effects related to study

drug and continued on drug; one subject withdrew early due to moderate side effects. No seizures were reported. Significant improvements in SWS neuroscore, patient-reported quality of life, anxiety and emotional regulation, and report of bimanual ability use were noted. Migraine quality of life scores were high at baseline in these subjects, and remained high. Neuropsychologic and other quality of life and motor outcomes remained stable, with some within-subject improvements noted.

Further studies are needed to determine whether cannabidiol can improve quality of life and be beneficial for neurological, anxiety and motor impairments in SWS independent of seizure control. Large multi-centered studies are needed to extend these preliminary findings.

Sturge–Weber syndrome: Updates in pathogenesis, diagnosis, and treatment. Annals of the Child Neurology Society. 2023 Jun. Literature suggests that early identification of brain involvement is essential for optimal medical care. Infants with a port-wine birthmark on the forehead, temple, or eyelids are at risk for SWS brain and eye involvement. Neuroimaging findings include leptomeningeal enhancements, cortical calcifications, and brain atrophy, and diagnosis requires magnetic resonance imaging with and without contrast. Before 1 year of age, neuroimaging has low sensitivity and may underestimate the extent of involvement; imaging after 1 year of age is needed to exclude brain involvement. The most common underlying cause for SWS is a somatic mosaic mutation in GNAQ. Neurological symptoms include seizures, stroke or stroke-like episodes, headaches, and cognitive deficits. Recommended treatment for SWS brain involvement includes aggressive seizure control with antiepileptic medications; low-dose aspirin is also frequently but not universally utilized. Current literature suggests that children with SWS may benefit from presymptomatic treatment; further study of this approach is ongoing.

Future Drug Trial Development

Funding continues to be sought for drug trials for SWS and for preclinical studies of new targeted treatments.

SPECIAL THANKS

We would like to acknowledge and thank the **Faneca 66 Foundation** and the **Celebrate Hope Foundation** for their generous support of SWS translational lab research.

Manuscripts for the following studies currently being prepared for submission:

- New developmental mouse model of SWS brain involvement
- Longitudinal biomarker and neurologic study in SWS
- History factors predicting severity of neurologic status in SWS

EXPANSION OF SWS CLINICAL SERVICES

We are pleased to share the recent expansion of our SWS clinical services. Dr. Comi now has clinic days twice a week (Wednesdays and Fridays). We also have a new monthly clinic for patients with SWS and medically refractory seizures with Dr. Comi and Dr. Ahmad Marashly, a pediatric epilepsy specialist at Johns Hopkins. Additionally, telehealth appointments are available for in-state Maryland patients and many international patients.

EDUCATIONAL EFFORTS

2023 Hunter Nelson Sturge-Weber Center Annual Virtual Sturge-Weber Family Webinar

The fifth annual symposium took place on October 14 featuring six speakers on the topic of stroke-like episodes in Sturge-Weber syndrome. The talks were recorded and are posted on the center website at KennedyKrieger.org/SturgeWeber under the News & Updates tab.

The goal of the event is to inform patients, their friends and families and providers about Sturge-Weber syndrome. Specific topics vary each year and may be related to identifying and responding to symptoms, treatment options, innovations in standard of care, or other topics pertaining to Sturge-Weber syndrome. Stay tuned for more information about our 2024 symposium!

EVENT HIGHLIGHTS FROM 2023

We'd like to share a few highlights from SWS supporters across the country.

Calvin's Crusade 5K Walk/Run

The second annual Calvin's Crusade 5K Walk/Run for Sturge-Weber Syndrome Awareness was held May 6 in Pennsylvania. The event brought in more than $21,000 for SWS research at Kennedy Krieger. Special thanks to the 150 participants, sponsors, volunteers and all who made this special event possible.

L to R: Katie Irvine, Natalie, Calvin, James and Eloise Torrance and Nanette and Bob Harford at Calvin's Crusade.

Rooting for Rainey Benefit Baseball Tournament

The Rooting for Rainey team hosted a benefit baseball tournament October 28 in Texas. The event featured a silent auction and raised $14,000 for SWS research at Kennedy Krieger. Thank you to all who made this event such a success.

Rainey LaPrade and Coach Shane at the Rooting for Rainey Benefit Baseball Tournament.

Run 4 Cole

The mother-daughters trio Cyndy Burdidge, Danna Lucca and Bari Clark formed the annual Run 4 Cole team to raise money for SWS research. The team is in honor of Cyndy's grandson, Cole, who was diagnosed at 10 months old. Each year the group participates in a race. Since 2015, they have raised more than $60,000 with nearly 150 donors. In 2023, they raised more than $6,000.

Clockwise from left: Cole, Cory, Bari and Keaton Clark and Cyndy Burdidge.

Buy a Home. Sell a Home. Do Good.

Real Estate Charities, founded by Mitch Ribak, broker associate at eXp Realty, LLC and the grandfather of Lola, a Kennedy Krieger patient with Sturge-Weber syndrome, adds greater purpose to buying and selling a home. Half of all referral fees collected by the company will support Kennedy Krieger with an additional amount of funds directly supporting the Hunter Nelson Sturge-Weber Syndrome Center.

Whether you are looking to buy or sell your home, you will have access to a network of more than 48,000 agents. Visit KennedyKrieger.RealEstateCharities.com for information.

Pictured: Lola and Mitch at one of their concerts

Lizzie and The Yellow Line

Lizzie Click at The Yellow Line Art Studio

Lizzie Click, a long-time patient of Dr. Comi's, once again donated 40 holiday gift bags she created for Kennedy Krieger inpatients. Included in the bags are DIY art kits from The Yellow Line Art Studio where Lizzie works with owner/artist Carrie Patterson. For more information on the studio and art kits, visit theyellowline.co.

If you would like to have your event featured or if you are interested in hosting your own event to raise funds for SWS research, please contact Jen Doyle via email at DoyleJ@KennedyKrieger.org or 443-923-4324.

Kennedy Krieger Institute

We look forward to keeping you updated on our progress and thank you for your support of our efforts.
If you would like information about research studies, please contact Dr. Comi at 443-923-9127 or via email at comi@kennedykrieger.org.