March 2016
Volume 1

CDG CARE

Where CARE Grows...

The first two children of the NIH CDG Natural History Study introduce Speaker, Lynne Wolfe, at the 2016 CDG Family Conference in Del Mar, CA

Welcome to our first Newsletter

The CDG community is an incredible community.

A community touching all corners of the Earth- marked by brilliant researchers and doctors, involved and dedicated mothers and fathers, supportive and patient families, curious and skilled

CDG Awareness

therapists and a pastiche of caring people all pulling in the same direction: To achieve a greater understanding and awareness of Congenital Disorders of Glycosylation.

May 16th - Congenital Disorders of Glycosylation (CDG) Awareness Day!

Meet the CDG CARE Board of Directors

Andrea Berarducci
President

"As the parent of a child diagnosed with CDG, Andrea is committed to providing support and resources for her daughter, as well as to help enhance education and increase awareness among other families struggling to cope with the diagnosis of this rare disease."

Alex Conner
Board Chair

"I hope to bring together families and professionals to foster awareness of CDG, support new families through the early phase of diagnosis, and encourage participation within the CDG community."

Kathleen Amaral
Vice Board Chair

"Mother to Liam DDOST CDG from Massachusetts."

Lori Rodriguez
Secretary

"As a community representative for the Board and because I have the pleasure of having a child with CDG in my life, it is my goal to support the efforts to educate others and promote awareness for earlier diagnosis of CDG."

Christa Thoma
Treasurer

"I'm here to create CDG awareness, help increase research, and for my daughter Gracie; the most determined little girl who gave me a new calling in life."

Cristina C. Might

"Cristina Casanova Might is the Executive Director of NGLY1.org where she engages in research, awareness and support for the first Congenital Disorder of Deglycosylation: N-glycanase (NGLY1) deficiency."

Duncan Webster, MD

"My daughter Maria has ALG9-CDG and I am a trustee of Foundation Glycosylation (the FoG) in Atlantic Canada with a goal to support research for the development of therapies targeting CDG and to raise awareness of the disorder."

Michelle Heim

"Mother to Sabina CDG 1a, hoping to raise a greater awareness for CDG in various communities and advocate for early diagnosis."

Holly Carmichael

“As a social worker and mother of a daughter with PMM2-CDG, I believe in Self-Determination and the importance that all individuals and families affected by CDG have the right and opportunity to make informed decisions and the ability to access needed services and supports.”

2016 CDG Family Conference

By Andrea Berarducci

The 2016 National CDG Family Conference was organized by CDG CARE in partnership with NGLY1.org and the Sanford Burnham Prebys (SBP) Medical Discovery Institute. This innovative and educational event was hosted February 28-29th in Del Mar, CA. The conference featured 15 captivating

presentations from experts on numerous aspects of CDG and included a diverse panel of clinical, investigational, translational (therapeutic) and community experts from across the United States.

The event was strategically organized to build upon the events leading up to RARE Disease Day 2016, specifically in collaboration with the SBP Seventh Annual Rare Disease Day Symposium: Human Glycosylation Disorders. Through this partnership, an inclusive and collaborative community infrastructure was developed where medical professionals and 27 families united to support and enhance CDG research, knowledge, therapeutic and alternative treatment strategies.

The Conference kicked off with a unique opportunity for families to participate in a 3-hour Doc-Is-In session comprised of small, intimate groups with CDG expert physicians and researchers to ask questions and discuss the CDG issues most important to families. Throughout the full day of Conference sessions professionals presented educational topics encompassing intellectual disabilities, hormonal abnormalities, dietary therapies and the diverse clinical spectrum of children, adolescents and adults diagnosed with CDG. Families learned the importance of and strategies on how to cope with CDG from the parental, sibling and extended family perspective.

The Conference presentations also provided an opportunity for families to hear from a panel of therapeutic experts from the fields of occupational therapy, physical therapy and speech therapy. In addition to learning tips on how to embed therapy activities into everyday life, speakers provided an extensive overview of alternative therapies and cutting edge therapeutic treatments for children and adolescents living with physical, developmental and sensory disabilities.

The goals and progress of the NIH CDG natural history study was shared with Conference participants. This interactive session provided the opportunity for families who have participated in the trial to share their personal experience with other families who have not yet enrolled. The findings of this study will help to successfully turn current research trials into potential therapeutic drugs that can be marketed to CDG patients.

The Conference presentations also educated families and professionals about the opportunity to participate in the collaborative, global patient database and research initiative, Rare Commons. Rare Commons is a global research project focused on the biomedical study of rare diseases that affect children. This patient-centered initiative will enable clinical analysis and health outcome data to be compiled, shared, and used to facilitate sustainable funding for future CDG awareness and research efforts.

The Conference was organized and run by volunteers, and made possible by grants, donations, sponsorships and a nominal participant registration fee. The 2016 CDG Family Conference received a generous charitable grant from WaterStone and was an honored recipient of the 2016 Global Genes RARE Patient Impact Grant Program. All Conference sessions were recorded and the post-conference video program can be viewed on the CDG CARE YouTube Channel.

2016 CDG Family Conference Best Moments Video

Recommended Evaluations Following Initial Diagnosis of CDG

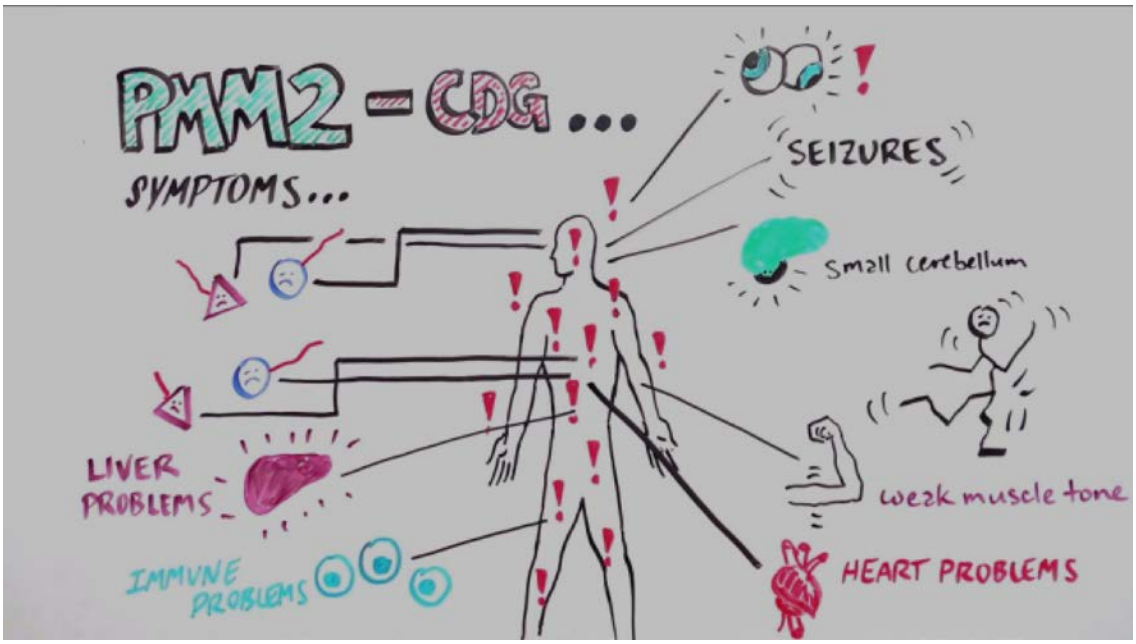
By Eva Morava

To establish the extent of disease and needs in a patient diagnosed with PMM2-CDG (CDG-Ia) the following evaluations are recommended:

1) Liver function tests (CDG patients can show chronically elevated liver function enzymes, which need to be followed regularly, especially in the first years of life)
2) Measurement of serum albumin concentration (low albumin can cause edema and fluid accumulation around the heart or in the abdomen)
3) Thyroid function tests (low thyroid function is common in CDGs)
4) Blood sugar (low blood sugar levels are common in CDGs)
5) Hormone studies for growth (this is for patients with short stature and growth delay)
6) Female hormone studies (this is only needed in older patients around the age of normal puberty)
7) Coagulation studies (coagulation factors have to be measured to rule out increased risk for bleeding) Hormone studies for growth (this is for patients with short stature and growth delay)
8) Anticoagulation studies (anticoagulation factors have to be measured to rule out increased risk for thrombosis)
9) Other blood tests might be needed based on the clinical features
10) Urinalysis (to evaluate for possible presence of protein in the urine)
11) Renal ultrasound (rule out congenital kidney malformations)
12) Consultation with a medical geneticist (the geneticist has to discuss the inheritance and recurrence risk with parents)
13) Consultation with the neurologist (also consider an MRI to rule out congenital brain malformations and depending on the symptoms also an EEG)
14) Formal ophthalmologic evaluation (this includes the assessment of retina and rule out possible cataract)

15) Consultation with the cardiologist (this should include an EKG and Echocardiogram as well)
16) Consult dietitian (in case of failure to thrive or chronic diarrhea, constipation)

Citation: Gene reviews on CDG (Sparks SE, Krasnewich DM) For questions please contact Eva Morava, MD PhD at emoravakozicz@tulane.edu



VIDEO: What is Congenital Disorders of Glycosylation (CDG)? How missing "sugar trees" cause a rare disorder.

USA CDG Tea Launch

By Christa Thoma

The launch of USA CDG Tea sales kicked off at the 2016 CDG Family Conference in Del Mar, California. The Swedish tea is a special blend created by CDG parent, Anna Lund, and developed to promote global CDG awareness and research initiatives. CDG CARE is honored to supply the delicious tea to those interested for purchase within the USA. The cost of the loose leaf tea is $10 per bag plus shipping. For purchasing information, please email christa.doot@gmail.com.

CDG Awareness Day

CDG CARE, and the greater CDG community at large, has been pushing hard for May 16th to be recognized at a national and global level as Congenital Disorders of Glycosylation (CDG) Awareness Day.

It's looking like this push for awareness has turned into a successful shove. With over 4,500 signatures on the petition that will be submitted to the World Health Organization, less than 500 signatures stand between the CDG community and a world-wide day to recognize this rare disorder.

Additionally, in the USA, State Delegate Volunteers have been identified in each of the 50 states and official Congenital Disorders of Glycosylation (CDG) Awareness Day Proclamation Requests have been submitted to the Governor's Office in every state. Through these efforts, May 16, 2016 will be the first recognized Congenital Disorders of Glycosylation (CDG) Awareness Day throughout the United States! If you are interested in the opportunity to serve as a State Delegate Volunteer, please email proclamation@cdgcare.com.

CDG
CONGENITAL DISORDERS OF GLYCOSYLATION WORLD CONFERENCE
The power of advancing patient-oriented research united
FAMILIES AND PROFESSIONALS

Second World Conference on CDG

By Fiona Waddell

Lyon – For the second time The Portuguese Association for CDG organised a world conference on the metabolic disorder CDG, which stands for Congenital Disorders of Glycosylation. This conference was held in Lyon, France, from the 28th until the 30th of August and preceded the SSIEM Official Satellite Symposia. The aim was to bring professionals, patients and families together. Doctors, scientists and researchers gave lectures about their current research and developments and patients and family members reported on what is interesting to them and the problems they encounter.

The conference was also intended to create greater worldwide awareness around CDG. But how do you get people interested in such an extremely rare disease? During the conference it became apparent that it should be made clear to the world that research into the glycosylation of proteins is also interesting for many other diseases and not just CDG. Some forms of cancer and cardiovascular diseases are also connected to glycosylation. Of the approximately twenty thousand genes in the human genome, the entire genetic information in a cell, no less than a minimum of four hundred genes make glycosylated proteins.

Glycosylation therefore has an important influence on the function of the whole human body and by studying CDG, science will achieve a greater insight into the functioning of human cells. That is what makes CDG so interesting to the outside world.

But what patients want the most is a cure for the disease and thanks to many studies, possible therapies are in prospect. Metabolic specialist dr. Morava told the conference that many problems of patients with PGM1 CDG can be treated with galactose nowadays. Galactose also appears to be a potential treatment for multiple forms of type 1 CDG. This is currently under further investigation.

Sugars, such as galactose, are administered orally, but a lot gets lost on the way to the cell. Agnes Rafalko, working at the young US company Glycomine, explained how using nanotechnology they are encasing sugars with fatty acid capsules the size of a virus. By doing this, the sugar can enter the cell more easily, which also ensures that less is lost. Because the capsules are so small, they can possibly even cross the blood-brain barrier, and thus end up in brain cells. This is positive news because eighty percent of the various CDG forms have neurological problems. This technology is still at a very early stage of development.

In order to think of even more therapies in the future, a study needs to be carried out of as many CDG patients as possible and this needs to be centrally documented. Lynne Wolfe of The National Institutes of Health in the US is working on that. Patients from all over the world can go to the institute where all different kinds of tests will be carried out during the period of a week. The institute will also carry out an annual follow up of the patient to chart the development of CDG in the long-term.

There was of course much more presented at the Conference. All the presentations were filmed and can be viewed here.

The Third World Conference on CDG will be held on the 15th and 16th of July, 2017 in Leuven, Belgium.

VIDEO: The Best of: Second World Conference on Congenital Disorders of Glycosylation (CDG), 2015 - (Lyon)

National Institutes of Health

CDG Natural History Study

By Lynne Wolfe

In order to successfully turn current research trials into potential therapeutic drugs that can be marketed to patients, a thorough natural history study needs to be carried out on as many CDG patients as possible and this needs to be centrally documented. Lynne Wolfe of The National Institutes of Health in the US is working on that. CDG patients from all over the world are eligible to go to the NIH, where various kinds of tests will be carried out during the period of a week.

For selected patients, the NIH will also carry out an annual follow up of the patient to chart the development of CDG in the long-term. This will help distinguish any health issues that are the result of the natural progression of CDG disease from any health issues that are possibly caused by the therapeutic drug. Findings from the CDG natural history study will serve as a resource for both future diagnosis and for researchers in the field to connect pathways with symptoms. Please note that the NIH CDG natural history study does have limited capacity.

For more information, please contact Lynne Wolfe at wolfe@mail.nih.gov.

Primary management for patients with PMM2-CDG

By Eva Morava

Acute infantile phase with life-threatening episodes

1. Most acutely symptomatic patients should be treated in a tertiary center
2. Infections should be treated early, and frequently with antibiotics
3. Low albumin levels with edema and possible abdominal or pericardial fluid collection should receive aggressive albumin replacement with Lasix®
4. Seizures have to be treated after the first convulsion by antiepileptic medication

Failure to thrive

1. Early in life, children may do better on elemental formulas.
2. Some children require placement of a nasogastric tube or gastrostomy tube for nutritional support until oral motor skills improve.
3. Children with a gastrostomy tube should be encouraged to eat by mouth if the risk of aspiration is low.

Protein losing enteropathy

1. Medium chained fatty acid rich formula is frequently beneficial
2. Octreotide therapy (i.m.) has been experimentally used in a few patients with success
3. Most patients require recurrent albumin replacement (with or without Lasix®) therapy

Recurrent vomiting and or gastroesophageal (GE) reflux

1. Thickening of feeds, maintenance of an upright position after eating, and antacids can be helpful for children with GE reflux and/or persistent vomiting.
2. Continued speech and oral motor therapy aids transition to oral feeds and encourages speech when the child is developmentally ready.

Developmental delay

1. Occupational therapy, physical therapy, and speech therapy should be instituted early on in the course of the disease.

Strabismus

1. Consultation with a pediatric ophthalmologist early in life is essential for adequate therapies that preserve vision (glasses, patching)
2. In some cases surgery is necessary.

Hypothyroidism

1. Thyroid function tests are frequently abnormal in PMM2
2. L-thyroxine supplementation should be reserved for only CDG. The hormone levels should be followed yearly. Those children who have elevated TSH and low free thyroxine levels and clinical symptoms of hypothyroidism.

Stroke-like episodes

1. Supportive therapy includes intravenous hydration as needed and physical therapy during the recovery period.
2. Some European centers apply L-Arginine therapy (100mg/kg/day). This treatment is so far experimental.

Coagulopathy/bleeding

1. Low levels of coagulation factors might cause clinical problems, especially during surgery. Clotting factor levels and clotting and bleeding time should be regularly followed.
2. Infusion of fresh frozen plasma corrects the factor deficiency and prevents clinical bleeding.
3. The potential for imbalance of the level of both pro- and anti-coagulant factors may lead to either bleeding or thrombosis.

Coagulopathy/Thrombosis

1. Care-givers should watch out for the signs of deep venous thrombosis.
2. Patients should avoid immobilization and dehydration to prevent thrombotic events

Immunologic status

1. Unless otherwise indicated, full pediatric vaccinations are recommended for affected children and adults.

Citation: Gene reviews on CDG (Sparks SE, Krasnewich DM) For questions please contact Eva Morava, MD PhD at emoravakozicz@tulane.edu

Meet the CDG CARE Medical Advisory Board

Canice E. Crerand, PhD

Assistant Professor of Pediatrics and Plastic Surgery
The Ohio State University College of Medicine and Center for Biobehavioral Health, The Research Institute at Nationwide Children's Hospital (NCH)

Dr. Crerand is a clinical psychologist in the Department of Pediatric Psychology and Neuropsychology at NCH. Her daughter, Marian, had ALG1 CDG (Type 1k).

Can (John) Ficicioglu, MD, PhD

Associate Professor of Pediatrics
Perelman School of Medicine at the University of Pennsylvania,
The Children's Hospital of Philadelphia, The Division of Human Genetics Section of Metabolic disorders Director, Newborn screening program Director, Lysosomal Center

"Dr. Ficicioglu drives towards increasing awareness for early diagnosis of CDG."

Hudson H. Freeze, PhD

Professor and Director, Human Genetics Program Sanford Children's Research Center

"My lab aims to discover new types of CDG and explain the cellular and biochemical basis for the abnormalities seen in CDG."

Christina T. Lam, MD

Fellow and Principal Investigator
National Institutes of Health
“I am a medical biochemical genetics doctor that works on the CDG Natural History Protocol at the National Institutes of Heath (NIH), and I will be transitioning in July to Seattle, Washington to join a Biochemical Genetics team at Seattle Children's Hospital and University of Washington where I plan to continue working closely with and taking care of families involved with CDG.”

Bradley S. Miller, MD, PhD

Associate Professor of Pediatric Endocrinology
University of Minnesota

“My goals are to better understand the hormonal issues (growth, puberty, hypoglycemia, bone and thyroid) that impact children with Congenital Disorders of Glycosylation.”

Eva Morava, MD, PhD

Professor of Pediatrics and Clinical Biochemical Geneticist
Tulane University and University of Leuven, Belgium

“I am a clinical biochemical geneticists who is focusing on care and developing treatment for patients with CDG”

Lynne A. Wolfe, MS, PNP, ACNP, BC

Senior Nurse Practitioner
National Institutes of Health

"Lynne has been a Nurse for over 30 years and a Nurse Practitioner working with children and adults who have all types of Inborn Errors of Metabolism and Mitochondrial diseases for 20 years."

Bobby G. Ng

Research Scientist, Clinical Coordinator and Lab Manager
Human Genetics Program, Sanford Children's Health Research Center

“For the last ten years I have devoted my career to helping diagnose individuals and understanding the basic science behind different forms of CDG. It is my goal to help continue moving CDG research forward, while raising more awareness for this disorder.”

CDG CARE (Community Alliance and Resource Exchange) is a nonprofit organization founded by parents seeking information and support for a group of disorders known as Congenital Disorders of Glycosylation (CDG).

Our mission is to promote greater awareness and understanding of CDG, to provide information and support to families affected by CDG, and to advocate for scientific research to advance the diagnosis and treatment of CDG.

CDG CARE

Visit us on the web at www.cdgcare.com or

send an email to info@cdgcare.com.