American Association of Neuromuscular & Electrodiagnostic Medicine Annual Meeting

September 21-24, 2022

The American Association of Neuromuscular & Electrodiagnostic Medicine (AANEM) annual meeting brought together neurologists, physical medicine and rehabilitation physicians, other allied health professionals, and researchers. Courses, plenary sessions, and workshops focused on the management and treatment of neuromuscular diseases including amyotrophic lateral sclerosis, muscular dystrophy, Duchenne muscular dystrophy, myasthenia gravis (MG), and spinal muscular atrophy.

The four-day meeting took place at the Gaylord Opryland Resort in Nashville, Tennessee, from Sept. 21 to 24, 2022. Below, we summarize some of the presentations that caught our attention during the first two days of the conference, and we will follow this up with a post-conference wrap-up report soon. Stay tuned.

Select sessions/highlights at the 2022 AANEM Annual Meeting

Status of inherited muscle diseases in 2022

The status of inherited muscle diseases in 2022 is "changing," said Holli Horak, M.D., a professor of neurology at the University of Arizona in Tucson and the immediate past president of the AANEM. "Formerly, these diseases were poorly understood and there was little that could be done," said Horak.

But that was then. Now, genetic evaluations, novel treatments, and the latest in the rehabilitation of persons with inherited muscle disease are changing patients' lives, she said.

Emma Ciafaloni, M.D., the Robert C. and Rosalyne H. Griggs professor in experimental therapeutics of neurological disease and a professor of neurology at the University of Rochester Medical Center in Rochester, New York, discussed new treatments for Duchenne muscular dystrophy. Kevin M. Flanigan, M.D., an attending neurologist at Nationwide Children's, the Robert F. and Edgar T. Wolfe

Foundation endowed chair in neuromuscular research, and a professor of pediatrics and neurology at The Ohio State University College of Medicine in Columbus, introduced novel therapeutic approaches to limb-girdle muscular dystrophies. In addition, Aloysia Schwabe, M.D., an associate professor of physical medicine and rehabilitation at Baylor College of Medicine in Houston discussed the current thinking on the management of inherited muscle disease.

Pushpa Narayanaswami, M.D., the vice chair of clinical operations in the department of neurology at Beth Israel Deaconess Medical Center and associate professor of neurology at Harvard Medical School in Boston, highlighted the latest progress during her lecture on the history of inherited muscle diseases called “From Histologic Harpoons to Genetic Scissors: A Journey Through the Muscular Dystrophies.”

Awards and accolades

Horak introduced the new AANEM president, Robert William Irwin, M.D., a physical medicine and rehabilitation specialist at the University of Miami Health System.

Daniel Dumitru, M.D., received the 2022 Lifetime Achievement Award for his commitment to education in electrodiagnostic medicine. Dumitru is professor emeritus in the department of rehabilitation at the University of Texas Health Science Center in San Antonio. This is the highest honor bestowed by the AANEM.

Anthony Chiodo, M.D., received the distinguished physician award for teaching, patient care, and his contributions to the field of physical medicine and rehabilitation and the AANEM. He is associate chair for clinical affairs in the department of physical medicine and rehabilitation and medical director of the Burlington ACU, the Spine Program, and the Spinal Cord Injury Program; codirector of the University of Michigan (UM) Spinal Cord Injury Model System; clinical director and fellowship director of UM spinal cord injury medicine; and clinical professor for the department of physical medicine and rehabilitation at UM in Ann Arbor.

Also at the meeting, Anthony Amato, M.D., received the Distinguished Researcher Award. Amato is the principal investigator for the NN109 MAGINE study and the vice-chairman of the department of neurology and director of the neuromuscular division and clinical neurophysiology laboratory at Brigham and Women's Hospital in Boston. “His research into neuromuscular disease, including inflammatory

myopathies and inclusion body myositis, have helped usher in our new era in treatment options for patients," Horak said.

'Great time to be a neuromuscular specialist'

Michael K. Hehir, M.D., a neuromuscular neurologist at the University of Vermont Medical Center in Burlington, discussed advances in the diagnosis and monitoring of respiratory decline in patients with neuromuscular diseases.

It takes a village, said Hehir. The medical team should include physicians, nurses, social workers, pulmonologists, respiratory therapists (including one who comes to the home), and family and caregivers.

"Monitoring our patients takes a multidisciplinary approach," Hehir said. "We need to measure pulmonary function and know when to initiate noninvasive ventilation."

Signs of hypoventilation include peak inspiratory pressure of forced vital capacity below 50 percent.

"As soon as patients enter the early nonambulatory stage, it becomes recommended that we should be monitoring respiratory function," Hehir said. He suggested considering sleep studies to see if oxygen is dropping at night.

The good news is that treatments for respiratory decline in patients with neuromuscular diseases are improving thanks to gene therapy and gene replacement therapy.

"We are changing the narrative," Hehir said. "Respiratory muscle weakness is important for us to be looking at it, monitoring, and intervening as early as possible. It is also important to recognize that interventions that improve lung capacity and a patient's ability to exchange gasses also improve quality of life."

For example, the U.S. Food and Drug Administration approved onasemnogene abeparvovec for the treatment of spinal muscular atrophy (SMA) in 2019.

The drug is approved in children younger than 2 years of age who are confirmed through genetic testing. Hehir discussed the findings from the study titled,

"Five-Year Extension Results of the Phase 1 START Trial of Onasemnogene Abeparvovec in Spinal Muscular Atrophy," published in *JAMA Neurology*.

This study looked at the long-term safety and durability of response in infants with SMA type 1 after dosing with osmogene abeparvovec gene replacement therapy. And so far, so good, Hehir said. Clinical follow-up supports the long-term favorable safety profile up to 6 years of age and provides evidence for sustained clinical durability of the therapeutic dose.

"It is exciting to talk about respiratory dysfunction in our patients today, and I am excited to see what happens as we develop more gene therapies for these patients," said Hehir. "It is a great time to be a neuromuscular specialist."

Cardiac manifestations in neuromuscular disorders

Cardiac manifestations in motor neuron disorders, neuropathies, neuromuscular disorders, and myopathies run the gamut from asymptomatic to lethal and include both conduction abnormalities as well as pump failure, said Nicholas J. Silvestri, M.D., a clinical associate professor of neurology and assistant dean for student and academic affairs at the Jacobs School of Medicine & Biomedical Sciences of the University of Buffalo in New York.

"Cardiac dysfunction is common in many neuromuscular disorders, especially the muscular dystrophies," Silvestri said.

As with respiratory decline, managing cardiac manifestations in neuromuscular diseases requires a team approach. "It is important that neurologists and cardiologists work in concert to treat patients with these disorders," said Silvestri.

Vyvgart in generalized myasthenia gravis: An update

Intravenous Vyvgart (efgartigimod alfa-fcab) is the first and only approved FcRn blocker in the United States for the treatment of adults with generalized MG (gMG) who are anti-acetylcholine receptor-antibody positive. A rare and chronic autoimmune disease, gMG occurs when immunoglobulin G (IgG) autoantibodies disrupt communication between nerves and muscles, causing debilitating and potentially life-threatening muscle weakness.

Drug maker argenx recently submitted a Biologics License Application to the FDA for subcutaneous efgartigimod (1,000 mg efgartigimod-PH20) for the treatment of gMG in adults.

Several abstracts presented at the meeting show consistent improvements in function and strength with infused Vyvgart over multiple years. Pooled data from ADAPT studies and real-world clinical settings suggest treatment was associated with clinically meaningful disease score improvements in seronegative gMG patients.

In ADAPT+, long-term treatment with Vyvgart provided consistent decreases in IgG antibodies and repeatable improvements in function and strength based on Myasthenia Gravis Activities of Daily Living (MG-ADL) and Quantitative Myasthenia Gravis (QMG) disease scores. Moreover, the long-term safety profile of Vyvgart remained consistent in the Phase 3 ADAPT trial.

Preliminary data suggest treatment with Vyvgart does not impact immune response to vaccinations, including COVID-19 vaccines.

“Vyvgart is a safe and effective treatment for patients with generalized myasthenia gravis,” said Silvestri. “Vyvgart attaches to and blocks the FcRn, preventing IgG from attaching in endothelial cells, causing IgG to be degraded in the lysosome rather than recycled into the circulation.”

The big picture? "Vyvgart is a safe, effective, and relatively rapidly acting treatment for this disease,” Silvestri said.

Topline data from ADAPT-SC show subcutaneous efgartigimod was noninferior to Vyvgart in total IgG reduction at day 29 and demonstrated consistent clinical improvement based on MG-ADL and QMG disease scores, according to an abstract presented at the meeting.

Assessing the economic burden in MG

Narayanaswami presented information on the economic burdens facing people with MG and their families. Of 815 people with MG and 243 caregivers who completed a survey, 70 percent reported making financial adjustments or seeking financial assistance due to the disease. Annual out-of-pocket costs were primarily driven by the cost of medications, medical care, and health care premiums and

deductibles. Income, race/ethnicity, education, gender, disability, and age were associated with care disparities. Lost wages were reported by 25 percent of survey respondents. These results will be used to educate the public and inform the work of advocacy groups, with the goal of improving the lives of people with MG, Narayanaswami concluded.