Summary - Autism & mitochondrial disorders: How much do we really know?

Dr. David Holtzman

What comes first: the chicken or the egg?
For years, parents of some children with confirmed mitochondrial disorders have described features of autism as part of their child's clinical "Mito" presentation. Recently, some parents of children with an autism diagnosis are now being evaluated for mitochondrial disease. Which comes first, and how are the two diagnoses related?

Today, we don't know the answer, and speculation and disagreement on the subject abounds. However, a few points emerge:

1. There appears to be a relationship between the two conditions, as well as the possibility of a metabolic component that exists in some children with autism.
2. Not all children with autism have mitochondrial disease, and not all children with Mito have autism. In fact, clinicians and researchers disagree on the percentage who have a co-existing diagnosis, stating numbers as low as 2% or as high as 30%.
3. The majority of physicians and public health clinicians strongly negate any relationship between vaccines and autism, yet there is an undercurrent of concern and disagreement in the parent population. Some physicians concede that the potential fever and associated immune response to vaccinations could contribute to an existing mitochondrial disorder, but emphatically remind families of the life-threatening potential of the diseases for which vaccines are given, especially for a child with a condition such as Mito.
4. More research, large population studies and discussion is needed.

When there isn't a test, the water is murky...
Dr. Holtzman emphasizes the importance of considering the complexity of the causes and characteristics of both autism and mitochondrial disease when drawing conclusions. For example, a small number of population studies describe a surprisingly large number of patients with a diagnosis of autism or ASD who were also found with abnormalities in lactic acid or pyruvic acid. These abnormalities are markers of some disorder of energetics, which is a mitochondrial function. So how can we translate a patient's lab findings, such as lactic acid levels, to the presence of mitochondrial disease? Dr. Holtzman explained that such findings do not independently correlate with mitochondrial disease. In fact, there continues to be debate about the diagnostic criteria and testing methods (i.e., fresh vs. frozen muscle biopsy) in order to accurately identify a mitochondrial disorder. Several other studies, including some from Dr. Holtzman's research, have shown abnormalities in either mitochondrial correlated genes or mitochondrial function in relationship to some presumed or definite relationship to autism. Understanding and describing these connections will take much further research at this point, but the studies do suggest that there may be some underlying relationship.

The Vaccine Debate

Dr. Holtzman acknowledged that there is much speculation regarding the existence of a connection between childhood vaccinations and the onset of autism, but noted that the scientific evidence does not exist at this time to infer a relationship between vaccines and autism, even in the presence of mitochondrial disease. However, there is no shortage of parents who will attest otherwise. Many feel that their proof lies in the health of the child who developed autism or mitochondrial disease shortly following these routine vaccinations. The debate again centers around the risks - perceived differently by clinician vs. parent. To allow a child to not be vaccinated presents the risk of serious infection; the consequences of these infections have been scientifically proven to be very dangerous, especially to children with an already weakened immune system. At this time there is no such evidence to the contrary, and to advise against vaccines would be putting many people and children at risk. On the contrary, many parents feel that it is misleading to state that there is no evidence connecting vaccines to either condition, and argue that the scientific community has not taken this question and answered "no"-- they just haven't answered it at all.

In the meantime, parents are advised to vaccinate their children in order to protect them from diseases which would be otherwise life-threatening. MitoAction also suggests asking your pediatrician about a staggered immunization schedule, pre-medicating the child with ibuprofen or acetaminophen prior to the vaccine, and aggressively avoiding fever and dehydration.

Searching for answers and working together

There are many reasons why there have not been any sufficient studies at this point to help parents navigate through their child's health care. For instance, a study involving deprivation of vaccines to a control group of children would be unethical, and to compare children with autism to those with mitochondrial disease, researchers may need to obtain permission to anesthetize children for brain scans. There are complex yet subtle relationships that need to be teased out over a long period of time through rigorous and careful studies, despite the urgency felt by the autism and mitochondrial disease community. When it is your child who is affected, as one MitoAction participant quotes, "most parents don't like the pace of science".

So, what can we do now? Dr. Holtzman acknowledged that while anecdotal evidence cannot be the source for the definitive information, it has real value. These stories lead clinicians and scientists to identifying which of the many questions are the critical ones to ask. Information gleaned from individual cases can lead to the better research questions and, with time, the answers we need. Parents, in the meantime, must become advocates for their children, and be proactive about managing their healthcare. For patients with mitochondrial disease, this may be educating others about germ control, balancing energy outputs, or learning more about the type of mitochondrial abnormality you are facing. Using passion, we have to help these children, parents need to join together to send a strong but diplomatic message to the scientific community of what is happening and what we need. The autism community has made great strides in building

visibility and awareness over the past five years and the mitochondrial disease community is following it its footsteps.