An Orange Socks Story: Sandra-ADNP

Interview by: Gerald Nebeker, President of Orange Socks

Welcome to the Orange Socks Podcast, where we are inspiring life despite a diagnosis, I'm your host Dr. Gerald Nebeker. In this episode I interview Sandra about her son, Tony, who has ADNP syndrome. Interestingly, Tony is a twin. I know you're going to love this interview.

Gerald: Sandra, thank you so much for taking the time to do an Orange Socks interview with me about your son, Tony, who is now ten years old. Tony is interestingly enough, a twin, so he has a twin brother, but Tony is the only one affected. So, why don't you tell me, when did you find out that Tony had ADNP?

Sandra: We did not get a diagnosis for Tony for six years, so he was about six and a half. That was after the genetic facility where we lived could not identify what was wrong with him. We went out on our own and found an undiagnosed study at Duke University and they diagnosed him. But, yeah, it took six years.

Gerald: What did you notice was different about Tony?

Sandra: At first, they were perfect, they were six and six-and-a-half pounds which is a pretty good size for twins. After a little while, Tony was not keeping his body temperature up and he was not sucking, so they brought him to the NICU. They later came and told us they had some concerns about his heart. We were sent to cardiology and that's when things got kind of sideways. They identified four heart defects. He had a very large VSD, he had an ASD and he has something called a right aortic arch, which means his arch is going the wrong way in the vascular ring. Those come with a very rare genetic disorder called chromosome 22 deletion. We were immediately sent for testing, and it took a while to get the results back. Tony had to have one of his first open heart surgeries when he was three months old and a couple of weeks later, we got the test back for chromosome 22 deletion. The results came back negative, and so at that time we thought, "Phew, we are out of the woods, he's fine, he's just having these problems because something is wrong with his heart." But what quickly became evident as the boys were growing, was something was off with Tony. He wasn't looking at us, he wasn't playing with toys, he wasn't hitting any of those developmental milestones like his brother was. We kept hoping he would catch up, and at about four or five months old we started getting different diagnoses. They told us he had cortical blindness, which doesn't mean he's blind, it means his brain wasn't processing his vision, so they sent him for an MRI. That's when our worst fears were confirmed that something much bigger was wrong with Tony. They identified that he had several brain abnormalities, they just kind of sent us to every specialist that there was at that point. Tony's diagnostic list just took off at about six months old, he had brain abnormalities such as hydrocephalus, he had

extra axial fluid and he had poor malnization, cerebral atrophy twice. He has seizures, congenital heart abnormalities, feeding problems, he would aspirate and throw up, he couldn't chew, he couldn't swallow, he had a feeding tube, he had global developmental delay, which included gross motor, fine motor and oral motor. He also has autism, severe cognitive and speech delays, his neurological structural and visual impairments, he's in diapers, and he has sleep problems. He needs help with every aspect of life, just lists of medical problems just kept coming and coming and coming. Within the first two years, after the genetic testing, and nobody could tell us what was going on. So, we just kind of got thrown into this thing and it just kept getting worse and worse and worse.

Gerald: So, when you finally got the diagnosis, what did you think about that?

Sandra: It's very hard to explain because after about year three or four when we heard of his first bout of cerebral atrophy, I started becoming mommy investigating and doing a lot of research and trying to find answers on my own. Essentially our genetic team told us, "This is unique to Tony. It's the Tony syndrome and you're never going to find out what's wrong with him. Knowing won't change anything, just roll with it." That wasn't good enough for us, we wanted answers. We spent all this time fighting for answers. I did every genetic study in the country I could find. We finally got into one and they diagnosed him. The meeting went like this, "We found something we've never heard of it and we've never seen a child with this. There's no treatments, no cures, no doctors who understand it and no medical protocol." They essentially had no information, so it was almost worse. Because what they could tell us was, "This is a major brain thing and it's going to affect him for the rest of his life severely." That diagnosis was almost more isolating because Tony was the only child in the U.S. that got diagnosed. After this was discovered there was one paper published on 10 kids. So, he was the 11th kiddo and the paper didn't have that much information that explained what this meant for his life or anything. So, it was almost worse because all of a sudden now you're all alone, there's nothing. It didn't even have a name at that point. Working with someone who has a condition that nobody knows about or understands is extremely hard. The first few years the doctors said, "Let's wait to see if he'll catch up." We didn't start progressive therapy, having no understanding of an extremely complicated disorder, you almost get less than if your child had something well known like cerebral palsy. We know what to do with those kids, it's, "let's get him to this therapy and that therapy." But our son was so complex with head to toe issues and his left hand was delaying the right hand all the time. We would go to the doctor to know why he is not looking at us and they said, "Oh, it's autism." But then this behavior, the doctor would say, "But this thing here," and then the genetic doctor would say, "The brain condition." Then the neurologist would say, "It's the autism." And everybody would ping-pong back and forth with the blame game, but no one had any idea of what to do. That was the most frustrating thing.

Gerald: Your story is so interesting, and unlike many parents who have a child who has some sort of mystery signs, symptoms, and conditions going on. When they

finally get a diagnosis, they're relieved. They can say, "Oh now we can hang our hat on this diagnosis." It didn't work that way for you, it wasn't helpful for you to finally get the diagnosis.

Sandra: It was helpful in one way, because you know like I jokingly say, "At least there was a piece of paper that told me something."

Gerald: Yeah.

Sandra: You know, I had this piece of paper with these numbers and letters. It was extremely isolating because here's this amazing team at Duke and they could tell me nothing. However, it ended up opening amazing doors for me personally and for the entire ADNP community. It kind of sent me into this path of, "Well, I'm going to learn about it, this gene." It was at that time the worst feeling. But it ended up being an absolute gift, because we wouldn't be where we are today, which is a significant improvement.

Gerald: What is ADNP?

Sandra: ADNP syndrome is also called something called wait for it "Helsmoortel-VanDerAa syndrome." That is the first and last name of the team who discovered the syndrome. We call it ADNP syndrome for short. It's caused by your ADNP gene which is your activity dependent neuroprotective protein gene. This gene affects brain formation, development, and brain function. It causes problems in utero with stuff like heart defects and other abnormalities in life. And it causes neurological, cardiovascular, endocrine, immune, gastro symptoms issues. It also affects vision, hearing, growth, feeding and sleep. It causes delays in intelligence, speech, motor planning and it causes autism. It is thought to be one of the most associated nonhereditary genes mutated in autism.

Gerald: We talked a little bit about the challenges earlier, but tell me about the joys.

Sandra: One of the beautiful things about most of these ADNP kids is that they are extremely happy, I don't know if you've ever heard of Angelman syndrome.

Gerald: Yes, I have.

Sandra: But most of our kids are thought to have Angelman syndrome. So Tony was always a very happy, loving and just a laughing little baby. He still is, although he's very autistic and repetitive. It makes it good for us and it makes it good for his therapist. Not just when everyone's around because he'll cuddle with you, he'll show off for you, giggle and laugh. All these kiddos are extremely hard working. He's been doing therapy every day since he was probably three years old and he does it with a smile on his face. That's why we call him our superman, he's a rock star.

Gerald: That's great. What has been his effect on your family, his twin brother and others and your immediate family?

Sandra: Oh, it's good and it's bad. We are learning so much about each other, it's just bringing our family closer and we're learning what's important in life. but it's hard too. They have a sister who is a couple of years older and they miss out on a lot because we are here every day till 7PM with therapists. They can't do something because their brother can't be there, or you just can't go on a vacation and do what normal families do. Once in a while my mom will take Tony for the weekend and we'll have what we call a "normal family day." Which is amazing, but it's things people take for granted like "Oh we can go to the movie theater and then go to the store." Like it's not a whole big planned event and we don't need diapers and wipes and all this equipment. We don't know any different, but it's very hard, then it's sad for his brother and sister because every year they'll try to buy him a birthday gift or a Christmas gift. They get him excited about it and he doesn't even understand what those things are. As they get older, they identify more and it's very sad.

Gerald: Now you have done some amazing things yourself, you've created an organization. Why don't you just tell me a little bit about what you have done.

Sandra: Like I was telling you earlier, there was no information when Tony got diagnosed. I came home and put this on my website, it's my quote, "The crazy obsessed, highly caffeinated, middle of the night internet stalking mommy." I just went full blown to find out everything that I can about this gene. That led me to the research team in Belgium and in Israel. They discovered the syndrome and the gene. and I immediately said, "You have 10 other patients, give them my number please. Anyone who speaks English, I just want to talk to another family." And then after talking with two families, it was clear that these people did not know that what our children have is identical. At that point I thought, "Hey let's start a Facebook group." I got a Facebook group together. I did this as a private parent's support group, and as it started growing, we all started sharing information. I started a crazy spreadsheet project, listing everything and I started working with these researchers, telling them like, "Hey you guys there's a lot more you don't know." It all kind of snowballed into parents identifying and describing this syndrome in extreme depth to help these scientists. I built a website and started putting my statistical data on there. And everyone who has since gotten diagnosed, their doctors are directing them to the website. They were using it for protocol. This snowballed and then I started working with researchers in the US, who quickly realized we needed a foundation. We need money because we need to start doing research. I started a nonprofit organization last year called the ADNP Kids Research Foundation. I got my own parent driven database, I've actually been on five medical publications as a co-author for things that have been discovered or helped identify. Three are published, two are peer review. But one of the most exciting things that I can say I've accomplished over the last couple of years has been I discovered a genetic file marker for ADNP.

Gerald: Wow.

Sandra: So that was really cool. I originally told you Tony has something called a right aortic arch. Which is in chromosome 22 deletion and is very unique to that. Most other syndromes with mirrored developmental disorders, their symptoms are all the same. There's nothing that stands out in chromosome 22 deletion, but the aortic arch stands out. So, as I started meeting these families and we are Facebook stalking each other's pictures and we are seeing like, "Hey did your kid have a full mouth of teeth when he was one years old?" So, we started to identify this was a file marker. I thought "Hey this is like the right aortic arch." Early tooth eruption isn't seen in any syndrome. I mean, I researched it. As we've found more and more families, I've finally convinced the scientific team in Europe to investigate it. They were able to identify that it is a unique file marker for only ADNP, and that 81% of our kids had a full mouth of teeth when they are one years old. It's critically important because it's an easy to see file marker that will direct doctors to test for ADNP. This is an autism syndrome; you can start these interventions at age 13 or 14 months old. Your child will have better quality of life than somebody like my child who didn't get to start progressive therapies till he was almost 6.

Gerald: That's so wonderful, good for you. You're not a researcher and you're not a doctor, but yet you accomplished something that's pretty amazing, that has had a great effect on the early intervention of kids with ADNP syndrome. Good for you, congratulations. That's awesome.

Sandra: Thank you.

Gerald: What is your website?

Sandra: Our website is a big informational website where I have patient stories. We list the phenotype description and just helpful hints, a lot of pictures and things that families that get diagnosed can see. Which is to me one of the best accomplishments ever, because no family is going to have what we did. They have a place now to find information. The site is www.adnpkids.com. Collectively that's now our hashtag and our brand, it is ADNP kids, even though we do have some adults now diagnosed. The foundation website is just adnpfoundation.org and they both link to each other so you can find either one from either website.

Gerald: Great. You've done some amazing things. If I were to come you, having a very young child that was just diagnosed with ADNP syndrome, what advice would you give me?

Sandra: I usually talk to most of the parents. I'll tell you what I tell most of them. I tell them to review the website, and if they see anything that they'd not have diagnosed or investigated to talk to their doctor about it. We had a family in the UK who had never seen a cardiologist, but their child I think at that time was 12 or 13 and I said, "Well, heart defects are well known in children with ADNP." She ended up

finding out her daughter had a pretty significant heart defect. I just tell them all, "You know your child best. If they are having a weird vision issue, like if they stare at the lights at windows, if they have a hard time looking at you for a long time, get them checked out for cortical visual impairment." We found out as well something very exciting as a parent group. Collectively we've found out that the number one reason our kids weren't talking was because they couldn't move their tongue purposefully. So, I tell parents to do what I call "the frosting challenge," have them put frosting around the outside of their kids lips and if their child cannot purposefully lick that frosting, then their child cannot purposefully talk. You can't talk without purposeful movement of your tongue, my son included. As soon as we started working on his tongue, he could talk. He couldn't talk until he was seven, and now, he can repeat any word you give him. I just tell them things that we have found to be unique to ADNP, and suggest they talk to their doctor about it because I'm not a doctor.

Gerald: That's amazing I'm just in awe of what you've accomplished, just congratulations.

Sandra: Parents are such a force because we see everything, we remember everything. We're not looking at hundreds of other syndromes, we are only watching our kids. So selectively, we are a powerhouse together. That's one of the most important things I've found out throughout this entire thing, is getting a parent group together and becoming organized. Everyone being on the same page getting a group of families who want to find treatment, we find out a lot if we do a lot.

Gerald: So there really isn't a spectrum per say as with the autism spectrum, but if you have ADNP there isn't as large a spectrum with that?

Sandra: Some of the things that are currently going on that are pretty exciting is that for the first time in the United States there is solo study on ADNP syndrome. So, a team based out of Mount Sinai senior center for autism just started doing an investigation to characterize the phenotype and the neurobiological pathways for the syndrome. They are going to look through the stem cell animal models and look and try to find some treatments for our kids. So, this is very huge for us. As I was telling you before, the parents are finding different symptoms, but we have no way to fund it. So, this is a very big deal for all of us as the families and we could have the first viable treatment option coming out of Israel soon at a place called Coronis Neuroscientist. It's these scientists who have a drug for Alzheimer's. Alzheimer's is linked to your ADNP gene so after the syndrome was discovered they started working on a similar drug for our kids and this could be a game changer. This could become ready for clinical trials this year. So, we are very excited about it. We are a little unsure how this will go down. Because the Seaver Project costs two million dollars and we've committed 10 kids and not quite two million dollars. But a lot of money for our 10 kids, they want to enroll 50. The Coronis is just a pre-clinical work and that costs a million dollars. We don't have three million dollars, so we are a little worried about that. But we are very hopeful because this could change our lives. We

could find some treatments for our kids, and we don't have any treatments right now, so for us it's pretty amazing.

Gerald: After our interview, Sandra emailed me and wanted me to add to her comments on what has been hard. She said quote, "One of the hardest parts of having a child with this type of lifelong disorder is knowing they are going to need full time care for the rest of their life which affects the rest of our lives," unquote. She states that they will never retire, or travel. They will have Tony with them until the day they die. Sandra worries about what will happen after they are gone, especially when she hears horror stories of group home placement. In addition, she said, quote, "Parents like us have to not only have to worry about paying for therapies and things our kids need to help them. We have to save and plan for living arrangements that will protect them and give them a good quality of life when we are gone," unquote. And lastly, Sandra laments the effect of Tony's syndrome on his siblings. She said, and quote, "We have tried to shield Tony's siblings from the stress and complexity of his syndrome, but they are affected daily. We love our children dearly and it breaks our heart that we can't give them a better life," unquote.

Gerald: I am so grateful to Sandra for taking the time to speak with me. I learned a lot. To find out more information about ADNP syndrome go to adnpkids.com

Gerald: Thanks for listening to this episode. Orange Socks is an initiative of Rise Incorporated, a nonprofit organization dedicated to supporting and advocating for people with disabilities. Follow Orange Socks on Facebook and Instagram and visit our website orangesocks.org. For more stories and to find national and local resources to help parents of children with disabilities.