Maternal Alloimmunization: Protecting My Baby from My Body

A Guest Blog by the Allo Hope Foundation's Bethany Weathersby

I grew up in a large family, loving both the chaos and the built-in friendships that came with having four siblings. My mom had five normal pregnancies and five healthy children, and I always (naively) assumed my experience would be the same.

Seven weeks ago my dream of having five kids — just like my mom — became a reality when I delivered my fifth living child, a beautiful 8-pound boy we named August. But while my mom's path to five children was smooth and uneventful, my journey to five kids was painful, rocky and tumultuous. I found myself faced with a question I never expected I would have to answer: what do I do when my baby is attacked by my own immune system?

The Diagnosis

My first two pregnancies were free of complications as I carried and birthed two healthy boys, Liam and Asher. It was when I was 9 weeks pregnant with my third child — our first girl — that my obstetrician gave me the news I was not expecting. My first trimester blood work came back positive for anti-Kell (or anti-K) antibodies, and I now had a condition called maternal alloimmunization.

Maternal alloimmunization, commonly known as Rh disease or isoimmunization, occurs when a woman makes red blood cell antibodies after being exposed to a blood type different from her own. This exposure to a foreign blood type usually occurs during a blood transfusion or a previous pregnancy. The woman's immune system views the foreign blood as a threat and creates antibodies to destroy it. This can be a serious problem if the woman becomes pregnant with a baby who has the offending blood type. In these cases the antibodies can cross the placenta in the second or third trimester and destroy the baby's red blood cells. This is called hemolytic disease of the fetus and newborn (HDFN). HDFN can have devastating consequences for the baby, including anemia, fetal hydrops and even death.

I knew about the more common anti-D antibodies or Rh disease, which can be prevented with the administration of Rhogam, but I had never heard of anti-Kell antibodies. Anti-Kell is one of the many other red cell antibodies that are similar to anti-D, but cannot be prevented. The more I learned about my diagnosis, the more discouraged I became. I realized that while my body was growing and nurturing my daughter, it was simultaneously trying to destroy her. I felt desperate to protect her from my antibodies.

Options and Questions

I immediately began researching treatment options. I learned that women with red cell antibodies should be closely monitored and treated by a maternal fetal medicine (MFM) specialist. Antibody titers show how many antibodies are in the mother's blood. Titers are checked regularly until they reach the critical level. Once titers are critical it means that

there is a risk of the baby developing severe fetal anemia. The baby can be monitored for anemia by special ultrasounds called MCA doppler scans. These scans measure how quickly the baby's blood is flowing through the middle cerebral artery in the brain. If it is flowing too quickly, the doctors know the baby is anemic and in need of a blood transfusion. Blood transfusions can be done in utero if the baby becomes anemic before birth.

The critical titer for Kell is 4. My titer was 1,024 right from the start of the pregnancy. My husband and I were terrified thinking through the possibilities.

I was referred to an MFM an hour away. In the online research I'd done to try to understand my diagnosis, I came across information about treatments called plasmapheresis and IVIG. These treatments had been used in severe cases to protect the baby from the mother's antibodies until the fetus was big enough for an intrauterine blood transfusion.

I printed off a copy of the study I found showing the efficacy of the treatments and brought it to my MFM appointment at 16 weeks. I asked if we should start the treatments to protect my baby in case she was becoming anemic. The MFM said the treatments were unnecessary and considered experimental. He also explained that they would not be checking the baby for anemia until further along in the pregnancy because nothing could be done to help anemic babies before 20 weeks. The smaller the baby, the more difficult and dangerous intrauterine blood transfusions are.

I left my appointment feeling uneasy, not knowing whether or not my baby was anemic. My mind buzzed with anxiety as I thought through my unanswered questions. I had read other women's accounts of successful intrauterine blood transfusions as early as 16 and 17 weeks gestation. Why did my doctors think that nothing could be done for my baby before 20 weeks? Why couldn't we be proactive and try the plasmapheresis and IVIG treatments I had read about online?

My fears grew day by day as I worried about my baby girl. I wanted to know exactly what was happening inside my body. Was my daughter safe and thriving? Or was my womb an unseen battleground where she fought for her life, unaided by all of us here on the outside?

I finally convinced my MFMs to do an MCA scan at 18 weeks to check our baby for fetal anemia. The results were devastating. The scan confirmed that our girl was extremely anemic and had started to develop fetal hydrops as a result. Our MFMs were not very hopeful about the outcome since the anemia was already so severe. They attempted an intrauterine blood transfusion the next day, but our little girl, Lucy Dair, died a week later at 19 weeks gestation.

Grief

Lucy was beautiful. She weighed one pound and was 9 inches long. My husband and I were completely overcome with grief. There is no pain in the world like losing a child.

To make matters worse, we not only lost our beautiful daughter Lucy; we also lost our hopes for future children all in one day. We were told that we could not have any more biological children since the antibodies tend to become more aggressive with each subsequent pregnancy.

Trying Again

Even after the doctors warned us of the dangers of future pregnancies, I could not let go of my dream for a big family. Five kids. How could we try again knowing that my own immune system would attack and possibly kill my next baby? I felt guilty for still wanting to grow my family despite having two living children while desperately wishing for better treatment options for alloimmunized women.

The plasmapheresis and IVIG treatments that we hadn't tried during my pregnancy with Lucy kept coming to mind. Could they be effective in a future pregnancy?

After many months of research, discussion and prayer, my husband and I decided to try again for another baby. This time we had a plan: we would use a different team of MFMs in a different state, and we would start plasmapheresis and IVIG treatments early in the pregnancy. Intrauterine blood transfusions can actually be done as early as 15 weeks so we would start weekly MCA scans at 14 weeks to monitor for fetal anemia.

We traveled 11 hours to Houston, Texas to find an MFM who was an expert on alloimmunized pregnancies. It turns out many women have to travel to other cities, states and sometimes even other countries in order to find MFMs who have experience treating alloimmunization and HDFN.

Our new team of doctors was extremely cautious and proactive, monitoring the baby carefully week after week. Our hope grew as the treatments seemed to be working, and, we found out we were having another baby girl.

The treatments kept her safe from my antibodies until 24 weeks when she became anemic and needed her first intrauterine blood transfusion. In total, our daughter had five intrauterine blood transfusions and was born healthy at 38 weeks. We named her Nora Juliet, our little light bringing joy back into our family. But she was also a reminder of the outcome that we could have had with Lucy if we had received the same care during my first alloimmunized pregnancy.

We went on to have two more little boys with the help of plasmapheresis and IVIG treatments as well as the help of our incredible MFMs. Our third son, Callum, had 3 intrauterine blood transfusions and was born at 34 weeks and our fourth son, August, was born at 37 weeks after seven intrauterine blood transfusions.

Hope and Advocacy

Over the years I have become an advocate for other women around the world who are facing alloimmunization and HDFN. I have seen familiar stories play out in their families: the shock of the unexpected complication, the terror that comes with a new diagnosis and the fear of not knowing how to protect their children.

Unfortunately, due to the rarity of alloimmunization and the variation in care practices around the world, well-managed pregnancies and ideal infant outcomes are not universal, but I have hope that they can be. Treatment options are improving for families facing alloimmunization. New clinical trials are underway to hopefully provide less invasive treatments for babies threatened by HDFN. In 2019, I started a non-profit organization called The Allo Hope Foundation in order to bring awareness to the disease and provide support and education to families facing alloimmunization and

HDFN.

If I could go back in time to the moment I first learned about my antibodies and if I could tell myself anything it would be this: You are your baby's best advocate and you have to be her voice. With the right medical care there is hope for your baby and it is up to you to find the doctors who will provide that care. Research, learn and speak up. These antibodies do not have to determine the size of your family.

To learn more about maternal alloimmunization and HDFN visit https://allohopefoundation.org.

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Holiday festivities sometimes include eating foods and drinks that might not be part of our everyday diet. During pregnancy and breastfeeding, we need to give a little more thought to what we should eat and drink. "Is it ok for the baby?" often goes through our minds during these times. As a teratogen information specialist at MotherToBaby who answers a lot of the questions we get via our texting service (855-999-3525), these types of questions ramp up during this time of year! So, here's some insight…

Popular Holiday Food & Drinks

Eggnog & Other Holiday Beverages

Eggnog seems to be a part of many holiday parties. Always be sure to check if the eggnog is homemade or not. Does it contain raw eggs, which can carry bacteria such as salmonella? If the eggnog was commercially made and packaged, then usually the eggs have been pasteurized, and the product may even have been heated prior to packaging. Also, always remember to check if the eggnog contains a little "holiday cheer" (i.e., alcohol) or not. It is common to add rum to eggnog, and we want to avoid alcohol when pregnant or breastfeeding (see our Alcohol Fact Sheet for more info). Other common holiday beverages include mulled wine, wassail, hot buttered rum, and of course wine and champagne. All of these contain alcohol as well, so it is best to avoid them and just stick with mocktails and non-alcoholic punch.

Smoked Salmon & Fruit

"Smoked salmon tastes wonderful on crackers with cream cheese! But is it ok during pregnancy?" one woman texted me. Here's what I told her. Smoked salmon is still considered raw fish as it is cured rather than cooked, so should be avoided during pregnancy due to the risk of foodborne illnesses. If the salmon has been heated to steaming, any concern for bacteria has been reduced. See our Fact Sheet on Eating Raw, Undercooked, or Cold Meats and Seafood for more info. Sometimes you will find foods that contain meats that have been dried, such as beef jerky. Although beef jerky is high in salt, there are not any other known risks to eating this tasty food during pregnancy.

"What about a fruit plate containing papaya and pineapple? Are there some worries about eating those fruits during pregnancy?" another texter wrote. Both fruits do contain enzymes that have been thought to induce labor. Papaya contains papain, while pineapple contains bromelain. Yet when eaten at normal levels (not daily!), these delicious fruits have not been shown to have any negative effect on a pregnancy. Of course, we hope the fruit has been well-washed before cutting and serving!

Eggplant Parmesan

"When the main dish is served, can we enjoy the amazing eggplant parmesan? Or what about eggplant ratatouille?" Eggplant is low in calories and high in fiber. Do avoid eating it raw, but cooked eggplant can be an occasional part of your diet. The concern is that eggplant is part of the Nightshade family and contains alkaloids in the leaves and tubers that can be toxic. But eating the fruit alone has not been shown to have any risks during pregnancy, especially when cooked.

Tiramisu

"Will rounding out our holiday meal with a delicious dessert such as tiramisu need to wait until after pregnancy and breastfeeding?" Traditional tiramisu contains two forms of alcohol, both Marsala wine and rum. Plus, liberal amounts of caffeine in the form of coffee and espresso. We have already mentioned that alcohol should be avoided if pregnant or breastfeeding, but what about the caffeine? Low to moderate levels of caffeine use (200 to 300 mg per day) has not been shown to increase any risks during pregnancy. See our Caffeine Fact Sheet for more info.

Who knew that holiday menus could need extra thought and consideration during pregnancy and breastfeeding?! Plus, with the added stress of COVID-19 this year, and the warnings to avoid large gatherings, you may have even more questions now than ever. Hopefully, this information will equip you to sit back, relax, and enjoy the festivities!

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Chelsea's chat came through late on a Wednesday afternoon: "Hi, I'm 23 weeks pregnant and have plans to visit my family in a different state this holiday season. My sister just had a baby and is breastfeeding, and my grandparents will also be there, so I want to be as safe as possible with COVID-19 still spreading. What do you think I should do?"

With Thanksgiving, Hanukkah, Christmas, and Kwanzaa all quickly approaching, questions like this are coming into our chat service more frequently. We're living in a new normal, and in the midst of rising COVID-19 case counts throughout much of the country, we're all trying to figure out the safest way to celebrate with our loved ones this year.

I told Chelsea there were many individual factors that go into a decision like hers, but we could go over a few guiding principles to help her make an informed choice.

Stay Home When Possible

Staying local and celebrating in-person only with other members of your household is the safest approach this year. This is especially true for pregnant individuals, who the Centers for Disease Control and Prevention (CDC) considers a

group that is at “increased risk of severe illness” from COVID-19. While celebrating in such small numbers is certainly not how any of us want to spend the holidays, it’s the best way to keep everyone safe. And if someone from outside of your immediate family really wants to join in on the fun – virtual get togethers are a great option!

Preparing to Travel

If it’s not possible for you to stay home, then prepare, prepare, prepare! One of the most important things individuals can do this holiday season is prepare for their trip ahead of time. Most importantly, this means taking precautions to limit your own exposure to the virus that causes COVID-19 for 14 days before you plan to depart. This may include things like less frequent trips to the grocery store, keeping kids home and socially distancing them from their friends, working remotely when possible, and avoiding any pre-holiday gatherings. If you have to go on an important outing (such as a prenatal visit), keep in mind the prevention basics: wash your hands, maintain distance, and wear a mask.

Getting tested for COVID-19 is another way to reduce risk prior to gathering. This is especially important to do if you develop any symptoms that could be COVID-19 (fever, cough, shortness of breath, loss of taste or smell, etc.). The test itself is not perfect and any interaction you have after the test is completed would put you at risk of exposure again, but for some families having a negative COVID-19 test can be a helpful tool in the preparation toolbox.

Choosing how you travel will also be important this year. Driving to your destination is one way to limit your exposure to others and reduce the risk of getting sick in transit. If you have to fly, take a bus, or get on a train, you will likely be surrounded by many other people, which is more of a potential risk. Get your hand sanitizer and mask ready if you have to go this route!

One other important thing you can do before traveling? Get a flu shot (ideally at least 14 days ahead of time)! While it won’t protect you from COVID-19, it will help prevent the flu, which can be serious for pregnant women. It will also help keep you from needing medical care, which is important since some communities are reaching max capacity in their hospitals and may not have room to admit you for treatment.

Think about Grandma

Next, you want to think about who you will be traveling to see. We know that certain individuals are more likely to get very sick and/or die from COVID-19. This includes older adults (with risk increasing with age) and those with underlying medical conditions such as type 2 diabetes, severe obesity, cancer, or pregnancy. Chelsea’s grandparents were in their late 80’s, and her grandma was also a smoker. She also had her new nephew to think about, and her sister who was breastfeeding. What seemed like a simple family gathering quickly became a lot more complex when everyone’s health was assessed.

If you have a high-risk individual in your family, it’s important that you consider their health when planning holiday travel. For some families, this may mean making the decision to break the wishbone virtually over FaceTime or Zoom. For others, it could mean a strict 14 day quarantine for all who will be gathering (discussed above) before any interactions take place.

Celebrating Safely

Whether Chelsea chooses to travel or stay close to home during the holidays, she can reduce the chance of coming into contact with the virus by continuing to take precautions while celebrating with others. Limiting activities to people in your own household obviously presents the least risk since you're already together anyway. But if you do host or attend gatherings with others, keep in mind that smaller groups in outdoor spaces where everyone wears a mask, stays at least 6 feet apart, and practices good hand hygiene is a much safer option than attending large indoor gatherings where not everyone wears a mask or follows other common sense precautions. Your decision to spend time around others should also consider the current spread of COVID-19 in the community where you live or where you will be traveling. I encouraged Chelsea to check the state department of health website for guidelines and recommendations for her destination.

What would a holiday celebration be without FOOD? You can still enjoy your favorite pregnancy-safe foods and beverages (no soft cheeses! no alcohol!), but you want to do what you can to reduce the chance of contact with any foodborne germs. Even though the chance of getting COVID-19 from contact with food or serving utensils is probably low, it's important that everyone wash their hands before preparing, serving, or eating food. Having only 1 or 2 people serve the food to everyone else while wearing a mask is a better choice than having lots of people handle the serving utensils or food containers. As yummy as potlucks or buffets can be, at least for this year it might be safer if each guest brings food and drinks for themselves and their own household members only, or picks up ready-to-serve items. In addition, since people clearly can't be masked and eat at the same time, plan ahead and get creative to create space between people when they sit down to eat – this year is definitely not the time to pile 12 people around a 6-person table! And as always, be sure that hot items are consumed hot, and cold items are consumed cold – no one wants a food-borne illness like E.coli or salmonella!

When the Party's Over

After attending any gatherings (even small ones) or staying with relatives, Chelsea will need to pay attention to any symptoms that could suggest possible COVID-19 infection. If she, or anyone else she spent time with, has symptoms or tests positive for COVID-19, she should contact her healthcare provider right away about testing and/or follow any instructions from her local health department. She will most likely need to self-isolate at home for 14 days. In addition, she should contact her hosts as soon as possible to let them know, so they can inform other guests and family members that they might have been exposed to the virus. Not fun, but a necessary part of helping keep us all healthy and safe throughout the holiday season.

Chelsea has a lot to consider this holiday season, as we all do. For more tips on celebrating safely during the holidays, visit the CDC's website on COVID-19 and holiday celebrations. And for more information about COVID-19 and pregnancy and breastfeeding, see our MotherToBaby fact sheet. However you choose to celebrate, we wish you a happy and healthy holiday season!

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Sometimes we have anxiety about…well, having anxiety. Kristen contacted MotherToBaby and was asking about ways to manage her already extremely high anxiety around pregnancy and birth during the pandemic. Should I even try to get pregnant right now? How will I deal with my anxiety and stress if I do become pregnant? What if almost no one in my family can even come to the hospital when I go into labor? How can I deal with my anxiety during labor and birth? I could tell she had a tremendous amount on her mind.

It is completely normal to feel stressed and anxious, and Kristen is not alone. Many people, regardless of whether they are pregnant during the time of COVID-19 or not, are experiencing higher levels of anxiety. The important thing is to address the anxious feelings and learn ways to manage them. I have some ideas on how to do just that! But one thing I need to emphasize: if your anxiety is excessive, ongoing, difficult to control, and interferes with your daily living, this may be a sign of generalized anxiety disorder and I encourage you to talk to your doctor or a mental health professional.

Managing Anxiety

There are ways to manage anxiety and stress that may be commonly shared, but in case you haven't heard them before below are some tips you can try at home:

- Exercise, even if it is going for a brief walk outside
- Call a friend just to catch up
- Volunteer or donate to a cause you care about – often doing things to help others actually can make you feel good
- Try to eat healthy, nourishing foods
- Journal as a way to express what you are feeling
- Take a break from your screen time on phones, tablets and TV – especially before bed
- If you feel like nothing really helps to address your feelings of anxiety and stress, or if you are feeling really down, make an appointment to talk to your healthcare provider and be honest about how you're feeling

If you do feel like you need to talk to your healthcare provider, how do you do it? Remind yourself that healthcare providers are not only trained to talk about mental health topics with their patients, but that they likely talk to multiple people every day or week about them. Sometimes pregnancy increases anxiety that is already present, and for others it may be that they are experiencing it for the first time. Being pregnant does not mean that you are immune from or that you cannot be treated for mental health issues.

Before you go to see your healthcare provider, you can write down some notes on what you hope to say. Try to be as honest as possible and ask about the variety of options you have to address your anxiety or symptoms, including what you can try at home, who you may be able to see for some form of talk therapy, and if necessary, what medications the provider may recommend trying. Remember, just because you bring up anxiety or mental health, it does not mean you will be put on a medication. Equally as important, if you need to take a medication to help you manage better, there are several options you can take during your pregnancy.

Working on dealing with your anxiety before becoming pregnant is always a great idea, but you can address it at any point during pregnancy or in the postpartum period. There is never a bad time to improve your mental health (doing so is not only good for you, but also good for your baby) and it is never too late. In addition, I have had women express that admitting they need help makes them feel weak or selfish. In truth, it is the opposite – it takes courage to ask for support when we need it!

COVID-19, Labor and Delivery

The other piece of Kristen's worry was having support in the delivery room. Due to COVID-19 many hospitals and birthing centers may be reducing the number of support people someone can have present during delivery. In addition, no one may be allowed in nearby waiting rooms. Giving birth can be one of the most challenging events for a person and having support during labor and delivery is incredibly important for getting through it with both a healthy mom and a healthy baby. First, you should speak with your planned delivery hospital/center to learn what their most current rules are for time of delivery and ask about any extra precautions they are taking due to COVID-19. Once you have that information, you can figure out what your game plan is. Other things to consider include:

- Does the hospital offer doulas? Would you want to hire your own? If you hire one and s/he is not allowed in the delivery room, can she call in and be there via facetime and text? Can she spend extra time going over pain management techniques with you and your support partner in advance if she is unable to be there herself?
- You can also consider programs like Hypnobirthing or Lamaze classes that really work with women to be confident in managing their experience during labor and delivery. Sometimes the type of prenatal education you choose to receive can help you feel more prepared and aware of what to expect, which alone may help reduce fear of the unknown.

In short, try not to panic with all of the questions you may have about dealing with anxiety. Write down your questions and make sure to ask your healthcare provider and the place you plan to deliver all of them. Prepare for what you can, take care of yourself, ask for help when you need it and trust that you have the strength to get through anything – because you do.

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"I just found out I am pregnant. I've heard that it is really important to get the flu shot this fall, but is it still OK now that I am pregnant?" The woman on the other end of the phone line sounded cautious and concerned. I told her, "I'm so glad you called to ask about this. The influenza vaccination may be even more important for pregnant women. The coronavirus pandemic has given us a lot to worry about without adding influenza infections to the mix. Let me tell you more about this…."

Influenza and Pregnancy

Once we are into influenza season (October to March), pregnant women are strongly recommended to get immunized, regardless of where they are in their pregnancy. Yet, many women delay, and in the end only about 50% of pregnant women get their flu shot.

An influenza infection itself can cause severe illness and even death in pregnant and post-partum women. It is important to remember that a healthy mother is more likely to have a healthy baby! The injectable version of the influenza immunization ("flu shot") contains an inactivated (dead) virus and is not going to make you or your baby sick. It is the most effective way to prevent influenza or have less severe symptoms if you do get the flu. Currently, the nasal-spray flu vaccination is not recommended for pregnant women because it contains live attenuated virus.

Will the vaccine harm my baby?

Some pregnant women are worried about whether immunizations will harm their baby. The scares about vaccines being associated with problems like autism have been shown not to be true. In fact, just last month a large study was published in the journal ***Pediatric***s, "Early Childhood Health Outcomes Following In-Utero Exposure to Influenza

Vaccines: A Systemic Review." This study compiled results from 9 earlier studies and found no association between exposure to the flu vaccine during pregnancy and adverse outcomes in children. One of the authors was later quoted as saying, "This should be reassuring for pregnant women who may be considering the vaccination..."

Are you interested in learning more about vaccinations in pregnancy or while breastfeeding? Visit the MotherToBaby website and read all of our vaccine-related fact sheets. There is a general fact sheet on all vaccines, and then specific fact sheets on the seasonal influenza vaccine and also many others like the Tetanus, Diphtheria, and Pertussis (Tdap), Measles, Mumps, and Rubella (MMR), HPV (human papillomavirus), hepatitis A, and varicella (chicken pox) vaccinations.

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