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Dispelling Common Misconceptions About Vaccines

Dr. Caudle:
Physicians and public health officials have been battling misconceptions about vaccine safety for over 20 years, yet common fears keep cropping up within patient and health advocacy circles regarding unsubstantiated links to chronic illnesses, harmful ingredients, immune system intolerances, and alternative dosing schedules and the net effect of these fears has proven to be costly with rises in vaccine preventable outbreaks now being witnessed across the country. Clearly, more effective methods will be needed to curb this trend, but what are the best practices for helping fearful parents' separate facts from fiction?

Welcome to Vaccine Nation on ReachMD. I'm your host, Dr. Jennifer Caudle, and joining me to discuss current barriers and solution strategies surrounding infant and childhood vaccines is Pediatric Infectious Disease Specialist, Dr. Barbara Pahud. She is an Associate Professor of Pediatrics and Associate Director of the Vaccine and Treatment Evaluation Unit at the University of Missouri Kansas City School of Medicine. Dr. Pahud, it's great to have you on the program today.

Dr. Pahud:
Thank you so much for having me. It's a pleasure to be here.

Dr. Caudle:
So, before we tackle some of the most common fears head-on, can you first speak to the scope of this issue around vaccine misconceptions and its impact on public health?

Dr. Pahud:
Absolutely. So, of course there's been vaccine hesitancy since the very first vaccine came about and it's never going to go away, but it comes up and goes down in waves. So, for example, when polio was rampant in the 30s and 40s, people were very eager to get a vaccine for it and as soon as a vaccine came out, it was very easy to get very high coverage because the disease was present. Now we are suffering from the actual benefit of vaccines. They work and, because they work, we don't see vaccine-preventable diseases as much as we used to, and that changes the focus from the fear of the vaccine-preventable disease to the fear of getting the vaccine. That's one of the main reasons why, lately, we have been seeing a resurgence of vaccine hesitancy.

Dr. Caudle:
I think that was very well put and I appreciate you laying that groundwork and talking about that theory. So, with that background, let's get up to speed on the current rationales out there for hesitating or refusing vaccines. What are some of the main misconceptions that you encounter and where do you think they started?

Dr. Pahud:
One of the main misconceptions is that my child does not need this vaccine and the reason why they believe their child does not need it is because they are unaware of the danger of the disease. So, I will give you two completely different examples. One is measles or polio. Diseases that people know exist, they're familiar with it, but they don't see them often. So, they believe it may affect somebody else, somewhere else, just not me. The risk of the disease to them seems so low that why would they bother giving their child a vaccine that may be dangerous, they perceive it as dangerous even though of course vaccines are not dangerous, they're safe. So, a parent, of course, is trying to do what's best for the child and they weigh the risk of getting the disease versus the perceived risk they have of a vaccine and they try to make the best decision they can. They go on the internet, they find scary stories, and they choose to opt out of vaccinations. A second example is HPV vaccine. They are completely unaware of the dangers of the disease itself because they don't see it. Even if they know people with cervical cancer, they just don't comprehend the danger of the disease, and so they opt out of the

vaccine because it's just not registering.

Dr. Caudle:
Now Let's role-play some common scenarios fears for a moment and get a sense for how we can respond to parents or the public when we encounter them directly. First up, is one of the most prominent misconceptions which is: "MMR causes autism."

Dr. Pahud:
There's been extensive research done around this topic and the MMR vaccine does not cause autism nor does any other vaccine. Unfortunately, these were rumors that were started with an article published back in the 80s that has been found to be fraudulent and it has been retracted by the journal. So, there is no causation. Multiple studies have been done comparing children that have been vaccinated to children that have not been vaccinated and the rates of autism are the same, which proves that there's no cause. So, there's a lot more evidence showing that there's no relationship and, unfortunately, social media will continue to fear what they fear despite of the evidence.

Dr. Caudle:
Let's talk about the next misconception that we often hear which is vaccine ingredients are toxic and cause a number of chronic illnesses. What would you say to that?

Dr. Pahud:
Every ingredient inside of a vaccine has a purpose for being there and there's a lot of concerns that parents have regarding some of these ingredients that have been thoroughly tested and that have been in vaccines and in other medications for many years and they've been FDA-approved and reviewed ad nauseam. So, I never get a parent who comes into the hospital, with a child with a bone infection or with meningitis questioning whether there is some component in ceftriaxone that they should be concerned about. What is the additive? What is the adjuvant? What should I do about that? Yet, they do question the vaccines. However, these additives, adjuvants, and stabilizers are on every product that we use, so I don't understand why there happens to be a target on the vaccine and, if you may, when we have additives and preservatives in pretty much everything else that we do.
So, formaldehyde for example, it's used to inactivate viruses that cause, for example, influenza and polio. It's diluted during the manufacturing process but it's a naturally occurring product in all humans that is used to synthesize. So, for example, if you find a cauliflower or a pear, it will contain about 30 mg of formaldehyde naturally versus vaccines will have less than 0.1 mg.

So, if you want to avoid formaldehyde, you will have to leave planet Earth altogether. We consume it and it is part of the vaccine. It is a natural product, it is in there for a reason, and it has been proven to be safe. A different example are additives. For example, adjuvant stabilizers and preservatives. The main one that people worry about is alum. Alum has been used in vaccines for over 17 years. It has a remarkable safety record and it is found in numerous foods and beverages, baby formulas, and honey. Typical adults ingest about 9 mg of alum per day and the amount that is found in a vaccine is about the same as that found in a liter of infant formula. I don't hear anybody advocating for us to stop breastfeeding or giving formula to babies, but I can tell you that there's about 4.4 mg of alum in vaccines during the first six months of life of a baby versus 7 mg of breast milk versus 38 mg in milk-based formula and the 117 mg in soy-based formula. Nobody is talking about soy-based formula or breast milk or saying that you should stop breastfeeding your child, obviously we should not, it is a safe amount to put in vaccines because we have it in other products.

Dr. Caudle:
Excellent. Let's go onto the next misconception that we might hear in the office. Let's say a parent says to you well, I don't want to give my child vaccines because giving infants several vaccines will cause an immune system overload. What's your response to that?

Dr. Pahud:
Fortunately, for us, babies were designed to survive us all. They are born through a birth canal in not the cleanest of conditions if you have ever been in a delivery room. The baby comes out already ingesting all sorts of antigens that are much higher at that moment in the delivery process than all vaccines combined, and babies are designed by nature to endure that. Number two, babies lick things, they grab toys, they chew on them, they crawl, they are, again, exposed to more antigens that you can imagine when they are babies than all vaccines combined. So, there's absolutely no data to support the fact that a baby cannot tolerate the amount of vaccines that we're giving because the vaccines that we're producing nowadays are very clean. They use very few antigens. A lot less than there would be on a pacifier that fell on the floor.

Dr. Caudle.
And, finally, what would you say to someone who presents the idea that delaying or spacing out vaccines on alternative schedules is the best way to go for safety.

Dr. Pahud:

There is no data to prove that an alternative schedule is safer than the traditional schedule that has been thoroughly studied and, actually, I would argue that it is harmful because you're leaving gaps in the coverage that the child needs to be protected against diseases when they are most at risk for them. So, for example, pneumococcal vaccine. I have, unfortunately, seen cases of pneumococcal meningitis in babies that only got one dose because they were spaced out. One dose is not enough, that's why we give three doses at 2, 4, 6 and then the booster after a year of age. Because, when you're a baby, your immune system is still learning to process antigens. One dose is not enough. You need multiple shots to give you that protection that you need and if you start picking and choosing which ones you're going to delay, the only person that is going to be at risk is the baby who is now exposed to very dangerous vaccine-preventable diseases.

Dr. Caudle:
We know that there's also underlying misconceptions out there that's adding fuel to the common fears that we talked about earlier which is a notion that vaccine-preventable disease rates have dropped for reasons other than the vaccines themselves and that vaccines really aren't as effective as everyone thinks. So, what's your response to this?

Dr. Pahud:
That if anybody can look back at history, that alone should be able to show you that it is not true. So, the one disease that we have been successful at eliminating, of course, since the 70s, smallpox, did not go away because we have better hygiene. That disease went away through very extensive public health interventions and it actually fought hard to stay on planet Earth, but we defeated it. And we defeated it with education and vaccines. Polio is the second disease that we've been able to eradicate. There are three different types of polio viruses and polio virus 2 we've been able to eradicate already, but we're still struggling with the other two and that struggle is real. We're very close but we're not quite there yet and it is not because of hygiene and all of those things. The places where we have not been able to eradicate it is because of war zones that we're not able to get in and immunize the patients. Everywhere else that we've had access with vaccines, we've been able to do it. Now, there's other disease like measles.

You know we're in the middle of an outbreak right now, so the only way that you could argue that that's true, is if you told me that all of a sudden this year we took a step back in our hygiene and that's why these diseases are coming back. That is not true. We still have our Clorox wipes and we're still washing our hands and we still have all of these funny diets that we expose our children to, yet, measles is back. The reason why it's back is clearly because vaccination rates have dropped. The relationship is clear. The correlation is absolutely true and those of us who understand science, if parents want to really dig into the science very clearly, they'll be able to see that vaccines work. If you just stay on the surface of Google searches and Facebook then, yes, you could probably believe any meme that is out there, but science is clear, and vaccines absolutely work.

Dr. Caudle:
Excellent. You know, I want to explore the role of multi-cultural perspectives around vaccines for a moment. Is it safe to say that not all communities or parts of the world look at vaccines the same way and does that play a part on outbreak developments both here and abroad?

Dr. Pahud:
Absolutely, because in the United States, for example, we're not doing a great job immunizing but we're better than other countries. So, the measles outbreaks we have seen, for example, most of them have come in through the outside world. Where in, somebody goes to Israel, the Philippines, they catch measles there and they come back. If we had a high enough immunization coverage here, it would not spread. But, because our coverage is dropping, it spreads because there are some susceptible people that can continue passing on the disease. So, it is both things, the community that doesn't immunize outside of the United States may continue to harvest that virus and then the people that are under-immunizing here will help propagate the disease once it comes in.

Dr. Caudle:
Now, looking back over the past few years, what were some lessons learned from the outbreaks we witnessed in this country.

Dr. Pahud:
The number one lesson I would say is 70 to 80% of people that have been affected by outbreaks thus far have been unimmunized patients. So, number one lesson is, if we immunize, we can help protect those outbreaks from spreading. And, if we immunize, we can help protect those that cannot be immunized. Some of those under-immunized or not immunized patients in those outbreaks could not be immunized because either they have cancer, leukemia, or because they're infants that are too young to get the vaccine. So, not all of those really get the disease due to their own fault. If you don't want to immunize and you get measles, I'm sorry to say it, but you wanted this, here you go. But, I don't think it's fair to say that if somebody who really has a medical contraindication, we need to do our job in public health and as human beings of taking care of each other and making sure that those that can be immunized do it to protect those who cannot.

Dr. Caudle:
As clinicians on the front line, what can we do individually if not collectively to prevent this from happening again?

Dr. Pahud:
So, unfortunately, we are a lot to blame for this problem because I have found a lot of hesitancy among providers and the reason is, well, providers come from the general public and if there is hesitancy among the general public, it's going to come into our fields if we don't do our job in educating our fellow residents and students and providers. So, I've been involved in a research study where we've been measuring vaccine hesitancy among residents and we have found that it is there. But, fortunately, it can be countered with education and we are not doing a very good job of educating our young healthcare providers because, again, they grew up without these diseases and so they don't quite understand how we ensure the safety of vaccines, the benefit of vaccination, the harm of vaccine-preventable diseases. They've rarely seen these diseases but, if we stay on this road, they're going to start seeing them and, of course, that's going to make a believer out of them because they made it of all of us who trained in an area where there's still vaccine-preventable diseases. So, partly, our job is to educate our fellow colleagues who are not as informed as we are and to continue to promote vaccination. It is astounding the amount of providers that I have met that do not recommend, for example, the HPV vaccine and that just breaks my heart because if anybody had told us 25 years ago that we would have a cancer preventing vaccine that we were not recommending, I think we would all just cry.

Dr. Caudle:
I think you're right. So, lastly, looking forward, where do you see things headed for the healthcare community over the next few years and, specifically, are we moving in the right direction or are more aggressive measures on a practice level or even federal level, going to be needed to prevent more outbreaks?

Dr. Pahud:
I think both and you can see it based on the outbreaks we've had this year of measles. There's been a lot of laws instituted, for example, in New York where most the outbreaks have happened where now they have removed personal belief exemptions, religious exemptions, and they are even fining people; if you have measles, and you are not vaccinated, you will be fined because you're costing the public due to that investigation and the control of the disease, so there are fines involved now that, unfortunately, may be the only way to go about it in that area. But there are laws that are being enforced throughout the United States to help decrease under-immunization due to vaccine personal exemptions, or due to medical reasons are okay, but religious exemptions are really not the right thing to do because there are no real religious reasons why you should not be able to vaccinate. So, there are laws that need to be passed, public health measures that need to be enforced, and, of course, the second piece of it is the education. We are now coming to the awareness of how much of a problem vaccine hesitancy is. It's one of the top 10 WHO identified health problems around the world and, because of that, everybody is turning their eye and their attention to this problem and, like part of my work, we are creating vaccine education curriculums for residents and providers because you can see that this is needed.

Dr. Caudle:
With that, Dr. Pahud, I would really like to thank you for joining me to review and hopefully dispel some of these current myths surrounding vaccination in the United States. It was wonderful having you on the program today.

Dr. Pahud:
It's my pleasure. Thank you so much.

Dr. Caudle:
To access more episodes from Vaccine Nation, visit ReachMD.com/vaccines where you can join the conversation and be part of the knowledge. For ReachMD, I'm your host, Dr. Jennifer Caudle, and thank you for listening.