Give it a Shot – Immunizations Podcast Series

Episode 2: The Importance of the Influenza Vaccine

Dr. Campanile: Hi, this is Chris Campanile. I’m a family practice physician at Coastal Hillside Family Medicine and also a Clinical advisor at Healthcentric Advisors.

We’re here today to talk to Dr. Stefan Gravenstein about influenza and vaccine about that infection.

Dr. Gravenstein: I’m a professor at Case Western Reserve University and an Adjunct Professor at Brown and I’m also a Clinical Director at Healthcentric Advisors. I do influenza research primarily.

Dr. Campanile: So, Stefan, we all know that this is the time of year that influenza is most prevalent and it’s important to vaccinate our patient population. Can you make a case for the idea of universal vaccination?

Dr. Gravenstein: Right, you know that everybody over the age of 6 months of age has now a standing recommendation for a flu vaccine. So, the discussion of who should get vaccinated – which used to be a big question - is no longer the question. It used to be we divide of high risk groups and so forth but it’s really everybody 6 months and older. The reason for this is two-fold:

One of them is that older people get worse disease and they can die from influenza and also infants - so there are these two age extremes.

The second reason is that everybody else can get sick too and they can give it to old people and young people. So you want to keep them from spreading it to each other.

And I guess there is a third reason and the third reason would be if you are of working age, even if the flu won’t kill you it will take you out of the workforce. There is economic reason and it’s been shown in several studies that getting working-age adults and even college kids and so forth has an economic impact that makes the vaccine very cost effective.

Dr. Campanile: And given those most vulnerable populations, can you talk a little bit about exactly what are the complications of contracting the influenza virus for an older person?
Dr. Gravenstein: Let me say something about why older people are different.

So, in young children, the reason they get severe disease is they have no immunity, their body has no recollection of having seen the influenza virus before. When the influenza virus infects them, it runs rampant until their body has time to build up a response. That response can take a couple of weeks to build up. In a child that is eight months old, a year old, two years old, they can get pretty sick before that immune system actually functionally kicks in.

In old people, it’s completely different story. They actually have a lifetime history of seeing influenza viruses. In any given year, you have a ten percent chance of getting infected. Your body, over the course of decades, gathers the immune information to have some protection from whatever is next.

Having said that, old people are different than children - in another, important way. They acquire – over the course of time – an immune response that just isn’t as robust. What that means, when they get sick, the response which includes producing molecules we call cytokines and a process we call inflammation. That process actually kicks up and kicks up more slowly in younger adults and it lasts longer, weeks longer, than it does in younger adults. The inflammation itself also creates another scenario, when you are in this inflammatory state from an influenza infection, or from any infection really, in old people the longer you are in that inflammatory state, the more likely it is that your blood will clot – meaning that this is a thrombosis. So the inflammatory state is a pro-thrombotic state. So, one of the things that makes it a challenge for older people with inflammation, is that this longer pro-thrombotic state sets them up for having a heart attack or stroke. In fact, their risk for heart attack or stroke following an influenza infection is bigger than the risk of dying of pneumonia. If you get a vaccine, a flu vaccine, your risk for developing influenza, pneumonia is reduced by 20-30% - even in an old person - but your risk for having a heart attack or stroke is equally reduced – the combination of either of those two. And those are actually more important outcomes because heart attacks or strokes change your life forever.

Dr. Campanile: That’s really interesting and probably not the way most clinicians think about the complications of influenza virus infection.

Dr. Gravenstein: Right, mostly we think about it as something that causes you have the sniffles and a runny nose. All of us have had the flu before so we think it’s something we all recover from. But old people are clearly different and they have outcomes besides pneumonia and sniffles.
Dr. Campanile: Stefan, could you also say a few words about the choices we have for influenza vaccines?

Dr. Gravenstein: Sure, there are actually quite a few choices out there. Realize that when choosing a vaccine you might offer to your patient, you might not be able to stock them all in your office. Think about these in these large categories. We have trivalent vaccines, trivalent means it contains the antigens for protection against, three types of flu, three strains of flu – 2 influenza A strains and 1 influenza B strain.

There are the quadrivalent vaccines which has everything the trivalent vaccine has plus an additional influenza B strain. Generically, when we talk about vaccines, we usually talk about them in one of those two buckets. Every year, when influenza circulates, you have a 50-50 chance it will be one of two influenza B strains. So the reason for quadrivalent it covers all of the influenza B strains. Whereas the Influenza B is relatively stable, you can always cover influenza B by just having the quadrivalent vaccine.

The Influenza A is a little more testy. The surface antigens in the Influenza A virus change and they change in a very methodically, predictable way. Which is not to say it’s not random. It is random – it’s not random that it happens. At every season, at the beginning of the season, you enter with one kind of influenza strain – a population of slightly different strains then through the course of the season these gradually change as a few antigens on the surface of the virus are different. So, by the end of the season it’s a slightly different virus than at the beginning of the season.

Likewise, when we make the vaccine, which is typically six months before the season begins there is sometimes a drift that happens to the beginning of the flu season. So, trivalent and quadrivalent vaccines both have a hazard and that the flu A strains they cover won’t be perfectly match but they probably won’t be too bad. When you give the vaccines, they’ll probably cover you for the chunk of the year.

In addition to just having these trivalent and quadrivalent presentations, the vaccines are given in different ways. You have something that be given as a shot that goes into the muscle, intramuscular vaccine. A shot that can go into the skin, it’s a tiny needle that goes into the skin, intradermal vaccine up to age 60. There is something that requires no shot at all. It’s done as a nasal spray, it’s done with a live influenza virus. This virus is not something that causes the influenza disease. It’s been carefully manufactured so that it isn’t able to make copies of itself if it gets too warm. Actually the only temperature where it can make copies is at the tip of the nose where it is cool enough. If you go back in the nasopharynx, it can’t replicate, so it can’t cause pneumonia or influenza – as we typically think about it.
Finally, there is a recombinant vaccine. The recombinant vaccine has really been developed in response to making a vaccine without the use of eggs. All of the other vaccines are grown in eggs – other than the subculture vaccine and recombinant vaccine. So now, having an allergy to the influenza vaccine is no longer an excuse to not get the vaccine now that there’s a choice out there.

A lot of practices don’t stock these options. What does your practice do?

Dr. Campanile: Yes, we have the vaccine that we use for 6-36 month-old kids and then we have the regular IM administered vaccine, flu-mist intranasal, and we have the high dose. We have to send people to other practices - for an allergist in particular – where they will receive the recombinant vaccine if they have an egg allergy.

Dr. Gravenstein: So there are a lot of choices out there and the recombinant vaccine is actually a new generation of choices. You should know that not all vaccines are approved for all ages so you need to take a look at what the labeling is. So the intranasal vaccine is just under the age of 50 from childhood and up, the intradermal vaccine is from age 18-64. There is a new agitant vaccine that has squalene in it that was just licensed in December of 2015. It isn’t on the market yet but will be for this coming flu season. It’s supposed to - like the high dose influenza vaccine that has four times the antigens – it’s supposed to generate more antibodies and more protection than the regular dose vaccine.

Dr. Campanile: Okay, well thanks Stefan very much for this informative discussion about influenza and vaccination for that viral disease.