PARENTS PACK

MONTHLY UPDATES ABOUT VACCINES ACROSS THE LIFESPAN

Blood clots: How those that follow COVID-19 vaccination differ

July 2021

Recently, COVID-19 vaccines made using an adenovirus vector, such as J&J/Janssen and AstraZeneca, have been found to be a rare cause of blood clots; however, the condition that develops is characterized by clotting that differs from what is typically thought of when one thinks of blood clots.

Check out this month's video-based *Parents PACK* feature article in which Dr. Paul Offit, Director of the Vaccine Education Center, discusses these differences. This video is part of the "Science Made Easy" series, which is devoted to addressing scientific concepts related to infectious diseases and the immune system.

Check out the new video today: **vaccine.chop.edu/videos**.
(Select "Science Made Easy" and then "Blood clots: How those that follow COVID-19 vaccination differ?")

Video transcript

Hi, my name is Paul Offit. I'm talking to you today from the Vaccine Education Center at the Children's Hospital of Philadelphia. There are three vaccines that are currently available in the United States for COVID-19, for preventing COVID-19. Two of them are mRNA vaccines, meaning messenger RNA vaccines, and one of them, made by Johnson and Johnson, is not. It's a so-called replication-defective adenovirus vector vaccine, a viral vectored vaccine.

Now, these vaccines are safe. But there's one thing that has come up that is a very, very rare, serious side effect caused by the Johnson & Johnson vaccine, and that is specifically blood clots. It seems to occur ... the serious blood clots seem to occur in roughly 1 person per 500,000 that get the vaccine. The blood clots are serious because they can involve the spleen, they can involve areas of the intestine, and they can involve the brain. The brain one is called cerebral venous sinus thrombosis. And it occurs in about 1 per 500,000 people who get the vaccine.

Well, are these blood clots similar to the other blood clots that people can typically get, because the incidence of blood clotting is actually fairly common. Blood clots in the United States occur in roughly 1 per 1,000 people. Usually they occur in the arms or legs, specifically the legs, so-called deep venous thrombosis. Sometimes those blood clots will break off and lodge in the lungs, called pulmonary embolism, and that all can be quite serious. Usually the risk factors are things like cigarette smoking, birth control pill use. So, there are the common blood clots. Then there were the blood clots, these very, very, very rare blood clots that could be caused by the Johnson & Johnson vaccine.

Are there any differences between these two types of clots? And the answer is, yes. There are two major differences. The blood clots that are caused by this J&J vaccine are associated with something called thrombocytopenia, which is a lowering of the platelet count. Platelets are those cells in your bloodstream that help the blood clot. So that's odd. It's odd that you would actually have a lowering of the platelet count, which is usually associated with bleeding, not clotting. But that is true. It's called thrombotic thrombocytopenia. So, it's not the typical blood clots.

The second thing is the mechanism by which the Johnson & Johnson vaccine is causing those blood clots. It causes it by actually activating something called platelet factor 4, which is a protein that's made by platelets that helps platelets aggregate, or said another way, helps platelets form a clot. So, in the people that have these blood clots, they have two things that normally people who have blood clotting don't have. They have a lowering of the platelet count and they also have antibodies in their bloodstream directed against platelet factor 4. So that's the mechanism by which these two different types of clots are very different.

But again, I want to underscore how rare this kind of blood clotting is. As of interest that when people get infected with SARS-CoV-2, when they get the disease COVID 19, they also can get clots. In fact, about 16% of people, roughly 1 out of every 7 people, who get infected with SARS-CoV-2 will have problems with increased blood clotting, and they can have the serious kinds of blood clots, including the blood clots in the brain, which occur in roughly 5 to 6 per million people, which again is much greater than is seen in the roughly 2 per million that is seen in blood clotting associated with the Johnson & Johnson vaccine.

So, because this virus is common and because it's important to prevent, it is still important obviously to get all these vaccines. But this rare blood clotting phenomenon associated with the J&J vaccine is likely real and, therefore, should be looked for. When, for example, you've gotten the J&J vaccine and you have things like headache or difficulty breathing or leg pain and you feel it's serious enough to see a doctor, it's very simple to tell whether or not you have a blood clot that's caused by this vaccine, which you just get something called a CBC, which just stands for complete blood count. It's available 24 hours a day in any hospital. And if you have a normal platelet count, then that is not anything that was caused by this vaccine.

Thank you very much.

Trivia Corner

What vaccine, other than human papillomavirus (HPV) vaccine, prevents a form of cancer?

a) Hepatitis A vaccine
b) Influenza vaccine
c) Hepatitis B vaccine
d) Rotavirus vaccine

[Continued on next page]

Trivia Answer: The correct answer is C. Hepatitis B virus can cause liver cancer; therefore, the hepatitis B vaccine prevents a known cause of cancer.

Go to **vaccine.chop.edu/trivia** *to play* ***Just the Vax***, the Vaccine Education Center's trivia game, where you can find this question and others like it.

NEWS & NOTES

Bring science to story time with *Vaccines Explained*

Often, young children only associate vaccines with the pain they experience when they get a shot, but an understanding of what vaccines are and why they are important can help them feel more comfortable. *Vaccines Explained*, written by Ohemaa Boahemaa, a public health expert originally from Ghana, simplifies the concept of vaccines and germs for young children. The book features multicultural families and is supported with lesson plans and activities as well as other child-friendly vaccine resources on the Language Lizards website.

Vaccines Explained is available in English and 11 bilingual editions. Visit the Language Lizard website **(languagelizard.com/Vaccines-Explained-Multicultural-Children-s-Book-p/vac.htm)** to learn more or order the book as well as watch a short video by the author.

Find other resources for kids and teens on this page of the VEC website: **vaccine.chop.edu/resources**, then scroll down to find "Resources for Kids and Teens."

The White House COVID-19 Vaccine College Challenge

Do you have, or know, a college student motivated to help end the COVID-19 pandemic? Have them check out "The White House COVID-19 Vaccine College Challenge." The White House is calling on college students to do their part in the fight against COVID-19 by not only getting vaccinated themselves, but also by urging others to do so.

Interested students can learn more or sign up on The White House website **(whitehouse.gov/COVIDCollegeChallenge/)**.

"Hepatitis Can't Wait"

Did you know that July 28 is World Hepatitis Day **(worldhepatitisday.org)**? If you're wondering why we still need such a day, the answer is simple. Hepatitis continues to infect millions of people around the world, many of whom are unaware they're even infected. This year's theme is "Hepatitis Can't Wait" because of the urgency for actions that "influence real change," with the goal of eliminating hepatitis by 2030.

Infection with hepatitis A, B, C, D or E can lead to liver disease and damage. Some types of hepatitis can result in a chronic infection that can lead to the development of liver cancer. Vaccines are available to protect against hepatitis A and B. Find out more on the Vaccine Education Center website. Available resources include:

- Why Do Newborns Get the Hepatitis B Vaccine? (video) **(bit.ly/2SZfo5s)**
- A Look at Each Vaccine: Hepatitis A Vaccine (webpage) **(bit.ly/2T8QVKN)**
- A Look at Each Vaccine: Hepatitis B Vaccine (webpage) **(bit.ly/3daZZpy)**
- Hepatitis A: What You Should Know Q&A, English **(bit.ly/3wWkZrQ)** | Spanish **(bit.ly/3wUXi32)** (PDF)
- Hepatitis B: What You Should Know Q&A English **(bit.ly/2Tdbx4I)** | Spanish **(bit.ly/3jlNyuP)** (PDF)

Information about hepatitis A and B is also available on our free mobile app, *Vaccines on the Go: What You Should Know* **(vaccine.chop.edu/mobileapp)**.

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If you have a question about vaccines, visit the Vaccine Education Center website: www.vaccine.chop.edu.

Send us your comments

If you have any comments about this newsletter or suggestions about how we can make our program more helpful, please send them to contactPACK@email.chop.edu.

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Vaccine Education Center