Difäm Health Community (DHC)

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Podcast: Vaccines against influenza

Hello to everybody. This is another podcast in our series on vaccination. My name is Chloee, I am a member of the health team of the German Institute for Medical Mission, also called Difäm. With me is my colleague, Ute. Today we will talk about vaccines against influenza, which is a viral disease influenza also called “flu”. People use the short form for all kinds of respiratory infections. However today, we will talk about the real flu, which is far more dangerous than a common cold.

Some countries experience severe seasonal epidemics of influenza during the winter in the northern hemisphere. How frequent is influenza in the tropical and subtropical regions of Africa?

Thank you, Chloee, for this question and hello to everybody who is listening. The WHO estimates that about one billion people become infected with influenza every year, of which 3 to 5 million suffer severely. Around the world, between 290 000 and 650 000 people die of influenza-related respiratory complications. In tropical regions, influenza may occur throughout the year, with irregular outbreaks. Morbidity and mortality from influenza in the tropics are likely to be underestimated due to the lack of confirming diagnostic tools.[1]

Ute, influenza differs from a common cold. Can you tell us a bit more about the viruses, which cause this dangerous flu?

Of course: Influenza viruses are Orthomyxoviruses and the most important subtype for humans is influenza A. This subtype can also infect animals like mammals and bird species. Droplets and aerosols transmit the influenza virus. 1 to 4 days after infection, symptoms like high fever, cough, sore throat, running nose, headache and severe malaise may occur. However, influenza can also be asymptomatic or mild. It is sometimes hard to distinguish Influenza from other infections causing flu-like symptoms, for example COVID-19! A person infected with influenza may develop respiratory complications like pneumonia, myocarditis or encephalitis. Secondary bacterial pneumonia may follow an influenza infection. Furthermore, the risk of stroke and myocardial infarction is elevated in the weeks following influenza.

In order to protect people against influenza, some public health systems offer annual vaccination against the disease and the vaccine is usually different from the one used in the year before. Why is this so?

The influenza virus is a drifting and shifting pathogen. It is constantly undergoing evolution and mutation. We remember that the antibodies of our immune system usually recognise the surface proteins of a pathogen. The influenza virus undergoes an antigenic drift, which means that the glycoproteins on the surface of the virus change. The antibodies created after vaccination in one year

will not recognise the drifted virus in the next year. Therefore, there is a need to adapt the vaccine frequently in order to make it responsive to the new virus drifts circulating around the world.

As I said before, the influenza virus can also infect animals. Due to such a crossover infection between animals and humans, the virus can undergo a shift. This shift entails a bigger change of the virus. A completely different strain can thus develop against which no one is immune. We experienced this in 2009, when the so-called swine flu broke out causing a pandemic. While the influenza virus undergoes antigenic drift all the time, it rarely undergoes an antigenic shift. If this happens, we are likely to have a problem.

What kind of vaccines against influenza are currently available?

Usually have at our disposal seasonal inactivated and live attenuated influenza vaccines, which respond to either three or four different virus strains. Twice per year, scientists of the WHO Global Influenza Surveillance and Response System identify the most frequent antigenic drifts and create the vaccine accordingly.

We can give the inactivated influenza vaccine in a high dose. This is primarily intended for people over 60 years of age who are at high risk to suffer severely or die from an influenza infection. Live attenuated influenza vaccines in short LAIV are available as nasal sprays. Therefore, they are very well suited to vaccinate children.[1]

To whom should we recommend the vaccination against influenza?

We recommend vaccination to all persons who carry a particular risk of developing a severe disease, which can result in hospitalization or death. The highest risk and burden of severe influenza, complications and mortality lies with older adults. The hospitalization rate can be 4 to 5 x higher than in younger adults. In addition, pregnant women carry a 7 times higher risk of hospitalization due to influenza than non-pregnant women. In addition, the risk of stillbirths is also increased. Apart from these groups, all individuals with underlying chronic health conditions should receive a flu vaccine shot.[2,3]

You said that the nasal spray vaccine is particularly suited for children. Do experts recommend vaccinating them as well?

A systematic review covering 30 years of seasonal influenza epidemiology in sub-Saharan Africa, found that influenza is responsible for about 10% of all outpatient visits and about 6.5% of hospital admissions of children due to acute respiratory infections.[4] These numbers speak in favour of vaccinating children. Another effect can be obtained by vaccinating the young ones: we can reduce community transmission significantly, especially to vulnerable groups. [1] Health workers are another group who should be vaccinated. They carry an increased risk of contracting influenza and may transmit the virus to vulnerable patients.

What side effects occur after a vaccination against influenza?

Inactivated vaccines have an excellent safety profile and are well tolerated by recipients of all ages including individuals with underlying conditions and pregnant women. Patients show typical side effects of vaccination like pain at the injection site and mild fever or headache.

The live attenuated influenza vaccines LAIVs are also well tolerated by healthy children and adults. However, LAIVs are currently not recommended for children under 2 years of age, pregnant women, older adults or those with comorbidities, because efficacy has not been consistently demonstrated in these groups.[8]

How effective are influenza vaccines?

The efficacy of influenza vaccines varies. It depends on how well the vaccines match the currently circulating influenza strains. In some years, they match better, in others they match less good. However, since the vaccines cover three or four different types of antigens every year, the chances are good that the vaccine protects sufficiently.

Nonetheless, we have to improve the data on influenza strains circulating in the southern hemisphere. We still know too little. In the text of this podcast, which you will find on the website of the Difäm Health Community, we will provide you with a link to the WHO influenza programme where you can find additional information on strains, vaccination zones and vaccination timing four your country: https://www.who.int/teams/global-influenza-programme/vaccines/vaccine-in-tropics-and-subtropics.[6]

Why do low and middle-income countries do not vaccinate against influenza as intensively as high income countries?

It is correct that low and middle-income countries do not vaccinate against influenza as frequently as high-income countries. The reasons are manifold and the situation is complex. Most countries in the southern hemisphere do not experience seasonal outbreaks of influenza but have to deal with a year-round activity of the virus. Though the real influenza causes much stronger symptoms than a normal respiratory infection, it may still be confused with the latter, if no laboratory exam is possible to confirm influenza. The vaccination is costly, has to be repeated annually and there is still the risk that the choice of antigens in the vaccine does not match the circulating virus. In addition, the vaccination of adults is less common though childhood vaccination works very well in most countries.

Are there additional options to protect us from an infection other than vaccination?

Yes, there are other measures and we know them quite well from all the sensitization on Covid-19. They are the same: wash your hands regularly, wear a mask in bigger gatherings, respect the respiratory etiquette when you have to sneeze or cough, keep some distance to a person with signs of a respiratory infection and isolate yourself if you feel a cold coming on. These measures, which were taken to control the COVID-19 pandemic, contributed to a significant global decrease in influenza activity in 2020 and 2021.[1]

It seems that there are many similarities between influenza and Covid-19. Especially older adults should get a vaccine shot. A last question: Is it possible to immunize against influenza and COVID-19 at the same time?

Yes, this is possible. WHO supports giving seasonal vaccines and any dose of a COVID-19 vaccine at the same visit to increase programme efficiency. This recommendation takes into account that older adults and those with comorbidities carry a substantial risk of complications if they become infected with influenza or SARS-CoV-2.[1]

Dear Ute, thank you very much for this profound information. Let me summarize the main points again. Influenza is a respiratory infection that is caused by a virus that evolves and mutates frequently. Older adults beyond 60 years of age and those with other chronic conditions carry an increased risk for complications due to an influenza infection and may require hospitalization. A considerable number of these patients die. While influenza shows seasonal peaks in the northern hemisphere, the southern hemisphere often experiences a year-round activity. Twice per year, a global expert group under the influenza programme of the WHO develops new vaccines that promise to match the currently circulating viruses. We have at our disposal inactivated virus vaccines for the older population and nasal sprays with live attenuated influenza vaccines also called LAIV for children, pregnant women and younger adults. Though vaccination is simple and side effects are mild, low and middle-income countries do not yet implement influenza vaccination campaigns due to reasons connected with economics and the strength of the health system.

Thanks to our audience for your interest and attention. You are welcome to our next podcast.

Be blessed and stay safe

Internet sources as of 06.10.2022

1 www.who.int/publications/i/item/who-wer9719

2 Reed C et al. Estimated influenza illnesses and hospitalizations averted by vaccination--United States, 2013-14 influenza season. MMWR Morb Mortal Wkly Rep. 2014;63(49):1151-4.

3 GBD 2017 Influenza Collaborators. Mortality, morbidity, and hospitalisations due to influenza lower respiratory tract infections, 2017: an analysis for the Global Burden of Disease Study 2017. The Lancet. Respiratory medicine. 2019; 7(1), 69–89.

4 Gessner BD et al. Seasonal influenza epidemiology in sub-Saharan Africa: a systematic review. Lancet Infect Dis. 2011;11(3):223-35.

5 https://www.who.int/initiatives/global-influenza-surveillance-and-response-system

6 https://www.who.int/teams/global-influenza-programme/vaccines/vaccine-in-tropics-and-subtropics

7 www.nejm.org/doi/full/10.1056/NEJM199204233261706

8 Chung JR et al. Live attenuated and inactivated influenza vaccine effectiveness. Pediatrics. 2019; Feb;143(2):e20182094.