



QUESTIONS AND ANSWERS ABOUT INFLUENZA VACCINE

No. 39b, 2005

When is it recommended to vaccinate?

In Denmark, vaccination is generally recommended from October to the beginning of November. The incidence of influenza varies from year to year in the period from November to March. If vaccination is given too late, many will not be able to build up sufficient immunity defences early in the season. If, on the other hand, vaccination is given before October, protection will be poorer late in the influenza season.

Why must the vaccine be given every year?

The quantity of antibodies against influenza declines with time and will not be sufficient to provide protection the following year. Furthermore, the different influenza viruses undergo genetic mutation, which means that immunity from a previous vaccination does not necessarily protect against the mutated virus. Because of this mutation, new vaccine that corresponds to the expected virus strains is manufactured every year.

Why is vaccination not recommended for everybody?

Vaccination against influenza is given with view to prophylaxis against severe influenzal illness or its complications. In young, healthy adults, vaccination will also prevent illness caused by the specific influenza strains in the vaccine. However, influenza does not constitute a serious threat to the health of young, healthy persons.

How does the vaccine work?

The influenza vaccine confers immunity through activation of B-lymphocytes (humoral immunity) with subsequent production of antibodies against surface proteins on influenza viruses. The vaccine does not provide sufficient activation of the T-cell immune system to build up immunological memory.

When is the vaccine protective?

The vaccine provides protection against the specific influenza strains in the vaccine after 2-3 weeks.

For how long does the vaccine provide protection?

Immunity usually lasts 6-12 months. As early as six months after vaccine

tion, the antibody level has fallen to 50% of the peak antibody level. Elderly people generally respond less strongly to the vaccine; i.e. their antibodies are at a lower level, and the antibody level falls more rapidly than in young people.

What are the active components of the vaccine?

The vaccine is a split-vaccine, i.e. it does not contain whole virus, but only the surface proteins haemagglutinin and neuraminidase from influenza virus, which activate the immune system. Thus, the vaccine cannot cause influenzal illness. The influenza vaccine contains surface proteins from three different influenza viruses: two different types of A-virus and one type of B-virus.

How are the vaccine strains in the year's vaccine determined?

A global network of centres under the WHO collaborate on an ongoing basis to identify the influenza viruses that are in circulation around the world.

On this basis, the contents of the vaccines are adjusted every year to contain the strains that are most likely to cause comprehensive influenzal illness in the coming season in the northern and southern hemispheres, respectively.

What are the most common adverse effects after vaccination?

Vaccination can cause local reactions (tenderness) at the injection site and, less commonly, general malaise, fever and muscular pains, which usually disappear in the course of 1-2 days without treatment.

Why are Guillain-Barré syndrome (GBS) and influenza vaccination associated with each other?

In the United States, a whole-cell vaccine was used in 1976, as there were fears of an outbreak of swine influenza. Subsequent investigations indicated that this vaccine caused an increased risk of developing GBS. However, it has not been possible to demonstrate a similar association with subsequent years' vaccines. It is important to emphasise that the vaccines that are in use today are so-called purified split-vaccines containing surface proteins from influenza virus, as distinct from the whole-cell vaccines formerly used.

Can the split-virus vaccine cause Guillain-Barré syndrome (GBS)?

Neurological adverse events occur very rarely after influenza vaccination.

A major investigation has suggested a possible increase in risk of one case of GBS per million vaccinated. However, it has not been possible to demonstrate a causal association with the influenza vaccine that is used today (split-vaccine). The suggested possible increase in risk can thus not be taken to mean that the vaccine causes GBS.

Should patients receiving chemotherapy be vaccinated?

Persons with acquired immunodeficiency should be vaccinated because of the risk of severe illness from influenza. However, the protection after vaccination in these persons is expected to be lower than in healthy persons.

Does the influenza vaccine contain thiomersal?

Since the 2003/2004 season, influenza vaccines that have been recommended for use in Denmark have not contained thiomersal as a preservative.

Thus, there is no thiomersal or other preservatives in the vaccine for the 2005/2006 season.

How many influenza vaccines are used each year in Denmark?

There are no available data for how many vaccines are administered in Denmark overall.

Statens Serum Institut has distributed the following numbers of doses of vaccines:

2000: About 605,000 doses
2001: About 585,000 doses
2002: About 615,000 doses
2003: About 710,000 doses
2004: About 690,000 doses

How many people in risk groups are vaccinated?

In Denmark, there are only figures for persons over the age of 65 who have accepted the offer of free vaccination.

The uptake of vaccination in persons over the age of 65 in Denmark has risen from 30% in 2002 to 52% in 2004.

The WHO's goal for this age group is a vaccination uptake of 80%.

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What causes influenza?

Influenza is an acute upper or lower airways infection with influenza virus type A or B, which circulate in Denmark each year to a greater or lesser extent from November to March, also known as the influenza season.

How is influenza transmitted?

Influenza virus is transmitted as airborne infection and usually from person to person through close contact, e.g. via drops on coughing and sneezing. Contact transmission can also occur, where virus in secretions from the airways are transmitted via the hands to the eyes or nose.

How long is influenza contagious?

The sick person is infectious from as early as the day before the onset of symptoms. However, adults usually transmit the disease 3-5 days from the onset of symptoms; children and young people can transmit the disease for up to seven days after the onset of symptoms.

What are the symptoms?

Influenza illness usually starts between 18 and 72 hours after transmission, with the sudden onset of fever, rigors, headache, muscular pains and dry cough. In children, symptoms such as nausea, vomiting and diarrhoea can also be seen.

How is influenza diagnosed?

The diagnosis is partially clinical and partially by laboratory testing with the detection of virus material in swabs from the throat and/or nose, as well as the detection of antibodies in the blood.

What is the course of the disease?

Infection with influenza virus may vary from mild symptoms to severe respiratory distress and circulatory collapse. In uncomplicated influenza, the cough may be prolonged, while the other symptoms usually disappear in the course of 2-7 days. In persons ≥ 65 years, a longer and more severe disease course is more often seen, and this may require admission to hospital.

What are the complications?

The most common complications are bronchitis and bacterial pneumonia. In children, otitis media is often seen, and in addition, influenza causes febrile convulsions and encephalopathy. In the elderly and adults who belong to the risk groups, there is a

risk of exacerbation of the condition, EPI-NEWS 39a/05.

How is influenza treated?

Uncomplicated influenza is usually treated with bed rest and analgesia and antipyretics as required. In Denmark, it is also possible to purchase a prescription-only antiviral agent, what is known as a neuraminidase inhibitor, for treatment of influenza in adults and children from the age of 1 year. If treatment is commenced no later than 48 hours after onset of symptoms, the average duration of illness can be reduced by 1-2 days.

How is influenza prevented?

Influenza vaccination is the only effective method of prophylaxis and is recommended each year to risk groups and persons ≥ 65 at the beginning of the season in October-November, EPI-NEWS 39a/2005. The same antiviral agent that is used for treatment can also be used as prophylaxis for unvaccinated contact persons.

Can other microorganisms give symptoms like those of influenza?

Yes, in the influenza season, other microorganisms circulate that can cause influenza-like symptoms and that can often be misinterpreted as influenza, e.g. respiratory syncytial virus (RSV), adenovirus and parainfluenza virus, rhinovirus, Mycoplasma pneumoniae and Chlamydia pneumoniae.

What is the clinical difference between influenza and the common cold?

The symptoms of influenza are usually more striking and more severe than those of the common cold. Also, complications such as pneumonia only rarely occur in association with the common cold.

How are influenza viruses classified?

Overall, there are three types of influenza virus: A, B and C. All subtypes of type A are found in nature, especially in swimming and wading birds. Three of the type A subtypes (H1N1, H2N2, H3N2) cause infection in humans and can cause epidemics. Influenza virus type B is only found in humans and can cause local outbreaks. Type B virus usually occurs in Denmark when the incidence of influenza virus type A is waning.

Similarly, influenza virus type C is only found in humans, but only gives rise to milder sporadic cases of influenza illness.

Why does influenza only occur in the winter half-year?

In temperate climates, influenza appears from November to March, while influenza virus can circulate all year round in tropical regions. The cause of the high incidence in the winter half-year is not known. A possible explanation may be that the risk of infection increases because we stay indoors more and are thus more often and closer together. At the same time, influenza virus can perhaps more easily survive in the dry air indoors, but this is uncertain, as other viruses that transmit infection in the same way exhibit different seasonal variation.

How common is influenza?

Influenza can strike many people in a short time and can spread in a population in one or two months. During the recurrent epidemics in the winter half-year, it is estimated that that approx. 10-15% of the population catch influenza.

What is an epidemic?

An influenza epidemic is declared when the incidence exceeds the expected frequency in a geographic area.

How often does an epidemic occur?

In Denmark, an influenza epidemic occurs on average every second or third year, and lasts four to six weeks.

What is an influenza pandemic?

A pandemic is a worldwide epidemic that affects large portions of the population of the world. This occurs when a completely new type of influenza virus arises, and there is thus inadequate immunity in the populations.

How often is there an influenza pandemic?

In the last 100 years, there have been four influenza pandemics. The most severe was the "Spanish influenza" in 1918. Since then, there has been "Asian influenza" in 1957, "Hong Kong influenza" in 1968 and most recently, "Russian influenza" in 1977; all three with mild courses. (A. H. Christiansen, S. Glismann, Department of Epidemiology)

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