Influenza in children

At the end of this lecture you would be able to answers

- What's the benefits of influenza vaccine?
- Which individuals are at increased risk of influenza complications?
- In which patients influenza should be suspected?
- In which patient the diagnosis should be confirmed?
- In which patients oseltamivir could be started? Which dose? Which duration?
- In which patient influenza vaccine should be recommended? When? What dose? Which frequency?
- What's the adverse event, contraindications, and precautions of the vaccine?

•What's the benefits of influenza vaccine? Would URTIs be decreased after influenza vaccination?

Complications of influenza infection

- Attack rate in each year: 10-40%
- Mortality: 1-4 per 1000,000 (60% in high-risk conditions)
- Otitis media in 10-50%,
- Acute myositis: rare, more in influenza B, extreme tenderness of the affected muscles, most commonly the calves, ↑↑ serum CPK, myoglobinuria
- Myocarditis and pericarditis: uncommon

Complications of influenza infection

- Hospitalization: 500 per 1000,000 in < 5 yr & 100-150 in 100,000 in 5-17 yr.
 - Mostly FWLS
 - 30% pneumonia
 - 20% exacerbation of asthma
 - 5% respiratory failure
 - 25% bacterial pneumonia
 - 8% CNS complications: FC, aseptic meningitis, acute cerebellar ataxia, transverse myelitis, guillain-barré syndrome, acute necrotizing and postinfectious encephalitis

Which individuals are at increased risk of influenza complications?

High risk groups for influenza complications

- Age <5 yr, especially <2 yr. or ≥65 yr.
- Age <19 yr + long-term aspirin therapy
- Immunosuppression: HIV, cancer, and chronic glucocorticoids
- Pregnant or postpartum (within 2 wks after delivery)
- BMI ≥40
- Residents of nursing homes and other long-term care facilities

High risk groups for influenza complications

- Chronic lung disease: asthma, COPD and CF
- Heart disease (except hypertension)
- Kidney disorders
- Liver disorders
- Blood disorders (including sickle cell disease)
- Endocrine disorders (including MD)
- Metabolic disorders (including inherited metabolic disorders and mitochondrial disorders)
- Neurologic conditions: CP, MR, stroke, muscular dystrophy, and spinal cord injury

•In which patients influenza should be suspected?

In which patients influenza should be suspected?

- Infant 5 mo. with high fever+ mild coryza in summer
- Child 1.5 year with fever+ coryza+ cough in winter
- Child 8 yr. with community acquired febrile pneumonia in autumn
- Child 4 yr. with exacerbation of asthma in spring

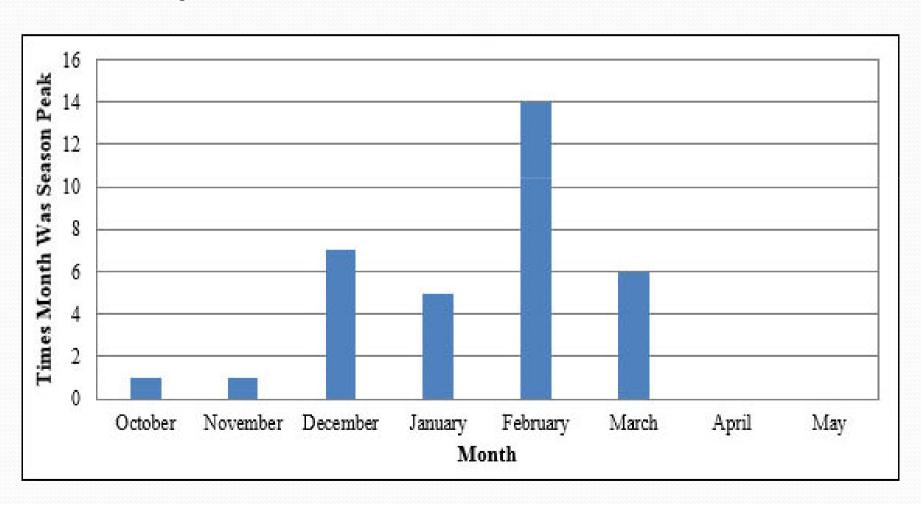
Clinical feature

- Classic symptoms:
 - abrupt onset of fever, headache, myalgia, cough, sore throat, rhinitis
 - slight to moderate oropharyngeal and nasal hyperemia, conjunctival erythema; nasal discharge; and cervical adenopathy
- Uncommon feature(< 1yr): high fever, FC, less respiratory findings, and more GI complaints (vomiting, diarrhea)
- Course: gradual improve within one week

Clinically suspected influenza cases

- During the influenza season or influenza outbreak:
 - Febrile infants
 - Fever and acute respiratory illness
 - Fever and exacerbation of underlying pulmonary disease (eg, asthma, cystic fibrosis)
 - Community-acquired febrile pneumonia
 - CXR Infiltrates of influenza pneumonia
 - Interstitial: 50%
 - > Alveolar: 25%
 - Interstitial and alveolar: 25%

Influenza season in northern hemispher countries



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•In which patient the diagnosis of influenza should be confirmed?

Indications of laboratory confirmation (RT-PCR) of influenza

- Risk of complications
- Hospitalization

•In which patients oseltamivir should be started? Which dose? Which duration?

In which patient oseltamivir should be started?

- 6 yr. nephrotic syndrome with high fever, cough and coryza in summer
- 1.5 yr. with fever and coryza in winter
- 8 mo. with high fever and slight coryza in late autumn
- 10 yr, Immunodeficent with coryza and cough in winter

Indications for antiviral treatment in suspected influenza cases

- Hospitalization
- Risk of complications
- In children for whom a decrease in duration of symptoms (1 day) be warranted by his or her provider

In which patients oseltamivir should be started?

- 6 yr. nephrotic syndrome with high fever, cough and coryza in summer
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•Time of antiviral therapy after start of influenza symptoms?

Time of antiviral therapy

- Within the first 12- 48 hours of symptom onset
- Beyond 48 hours in severely ill patients and patients with certain underlying medical conditions, such as the immunosuppresion

• Which drug? Amantadine or oseltamivir?

Anti-influenza drugs

- Oseltamivir:
 - 99% sensitive
 - Adverse effects:
 - Gastrointestinal: 14% compared to 8% in placebo
 - Neuropsychiatric: rare, delirium, hallucinations, confusion, abnormal behavior, convulsions, and encephalitis
 - Death: rare
 - Skin reactions: rare, toxic epidermal necrolysis, Stevens-Johnson syndrome, and erythema multiforme
- Amantadine:
 - Not active against influenza B
 - High level of resistance among influenza A
 - Not recommended

Oseltamivir

- Dose:
 - < 1 yr:
 - < 9 mo.: 3 mg/kg/dose bid
 - > 9 mo: 3.5 mg/kg/dose bid
 - > 1 yr:
 - <15 kg: 30 mg bid
 - 15-23 kg: 45 mg bid
 - 23-40 kg: 60 mg bid
 - >40 kg: 75 mg bid
- Duration: 5 days
- Preparations: Cap 75 mg, Susp 60 mg

•In which patient influenza vaccine should be recommended? When? What dose?

Indications of vaccination

- Individuals at risk for severe or complicated influenza
- Household contacts and out-of-home caregivers of high risk individuals, including children <59 mo., and especially <6 mo.
- Health care personnel

گروه های پرخطر آنفلوانزا

- خانم های بار دار
- کودکان ۶ تا ۵۹ ماهه (به خصوص در سن زیر ۲ سال)
 - افراد بالای ۶۰ سال
- کارکنان بخش های بهداشت و درمان به ویژه در تماس مستقیم با بیماران آنفلوانزا
- افراد دچار سرکوب سیستم ایمنی شامل مبتلایان به HIV/AIDS
 - مبتلایان به ضایعات نخاعی و بیماری های عصبی عضلانی
- مبتلایان به بیماری های مزمن ریوی (از قبیل آسم و بیماری های مزمن انسدادی ریوی)
 - بیماری های مزمن قلبی عروقی (بجز پر فشاری خون تنها)
- مبتلایان به بیماری های مزمن کلیوی، کبدی، عصبی، خونی و اختلالات متابولیکی (شامل دیابت قندی)

گروه های پرخطر آنفلوانزا

- افراد با چاقی مرضی
- افراد ۶ ماهه تا ۱۸ ساله تحت درمان طولانی آسپیرین
 - ساکنین و کارکنان آسایشگاه ها
- کارکنان شاغل در مر غداری ها و پرورش دهندگان طیور و پرسنل سازمان دام پزشکی و سازمان حفاظت محیط زیست که در قسمت های مرتبط با پرندگان فعالیت می نمایند.
- مراقبین و سایر افراد در تماس نزدیک و خانگی با بیماران پر خطر

• Effectiveness of influenza vaccine?

• Effectiveness against vaccine strain: 60% (50-80%)

Which brand of vaccine is preferred?

• No preference between one brand over another is present.

• Dose and frequency of influenza vaccine?

Dose and frequency of influenza vaccine

- 6 mo.- 36 mo.:
 - < 2 previous vaccination: 2 dose, 0.25 ml
 - ≥ 2 previous vaccination: 1 dose, 0.25 ml
- 3-9 yr.:
 - < 2 previous vaccination: 2 dose, 0.5 ml
 - ≥ 2 previous vaccination: 1 dose, 0.5 ml
- > 9 yr.: 1 dose, 0.5 ml

• Time of influenza recommendation?

•Time of influenza recommendation?

Time of influenza recommendation

- Before the onset of influenza season (eg, by the end of october)
- Should be provided as long as influenza viruses are circulating and influenza vaccine is available

• Adverse effects of influenza vaccine?

Adverse effects

- Local reaction with soreness at the injection site
- Fever: within 1st day, usually low grade, predominately
 2 yr.,(10-35%)
- Slight increase in guillain-barré syndrome in some years in adults, but only rarely in children

Contraindications and precautions of influenza vaccine?

Contraindications and precautions of influenza vaccine

- Contraindications:
 - History of severe allergic reaction to influenza vaccine
 - History of severe allergic reaction to any component of the vaccine
 - Most IIV contain small amounts of ovalbumin
- Precautions:
 - GBS within six weeks after previous influenza vaccination
 - On the same day with PCV or DTP