

Learning objectives

At the end of this lecture, students will be able to

- Identify details of each vaccine which include thorough understanding of nature, route, doses , complications and precautions)
- When to Recommend Vaccines in the special occasion

BCG

(Bacilli-Calmette-Guerin)

- Live attenuated strain of Mycobacterium bovis.
- BCG vaccine not prevent tuberculosis but its effective in reducing morbidity and mortality of TB in children
- BCG prevents dissemination of TB or development of other life-threatening complications such as meningitis.
- Intradermal injection(0.1) ml into the lateral aspect of the left upper arm(deltoid muscle).

Vaccine response:

- Successful vaccination leads to the development of a small local swelling within 2 weeks and then lesion progresses to a papule or shallow ulcer that heals within 12 weeks to form a small, flat scar

Adverse effect

- Local ulceration and regional suppurative adenitis with(abscess)
- In immunocompromised patient, it can cause disseminated or life threatening TB infection (so its contraindicated in immune compromised)

Polio vaccine

- OPV(Sabin's polio vaccine –oral polio vaccine)
- IPV (Salk's Polio vaccine “Inactivated Polio Vaccine” IPV, injectable)
- IPV has essentially no adverse effects

- OPV on very rare occasions has been associated with paralysis (vaccine-associated paralytic poliomyelitis)
- At birth, 2, 4, 6, 1st booster dose at 18 mo, 2nd booster dose at 4-6 yr

Contraindications

- Immunocompromised
- Presence of immunodeficient household contacts

DPT vaccine

- **DPT** : (Diphtheria, Tetanus toxoid and whole cell pertusis)
- **DTap** : (Diphtheria, tetanus toxoid and a cellular pertusis): **is less side effect**
- **dT** vaccine (adult preparation) It is a mixture of toxoid of diphtheria & tetanus is given to children ≥ 7 years of age, as pertussis vaccine is contraindicated after this age.
- DTP and DTaP are administered in a dose of 0.5 mL, IM, five vaccinations before age 7 years (at 2, 4, 6, and booster doses 18 months and at 4-6 years)

Contraindication

- Severe allergic reaction after a previous dose
- Encephalopathy, progressive neurological disorder

Complications

- Fever of $>40.5 \leq 48$ hrs after vaccination with previous dose
- Collapse or shock like state ≤ 48 hrs after receiving a previous dose
- Seizure ≤ 3 days of receiving a previous dose
- Persistent inconsolable crying lasting ≥ 3 hrs and ≤ 48 hrs after receiving a previous dose
- Guillain-Barre syndrome ≤ 6 weeks after a previous dose of tetanus toxoid containing vaccine

MMR

- Composed of three live attenuated vaccines (Measles, Mumps & Rubella)
- This highly effective vaccine is administered SC in two doses ,The first MMR dose is recommended at 12 - 15 months and the second at the child's entry into school (4 to 6 years)

Side effect

- Fever and rash
- Transient arthritis
- Thrombocytopenia (rare)
- Encephalopathy(very-rare)

Contraindications and Precautions

- 1. Severe allergic reaction to vaccine component or following prior dose
- 2. Pregnancy
- 3. Immunosuppression
- 4. Moderate or severe acute illness
- 5. Recent blood product
- 6. History of thrombocytopenia or thrombocytopenic purpura

Hepatitis B (Hep B) vaccine

- Administer monovalent HepB to all newborns before hospital discharge
- Is recommended in 3 doses starting at birth ,2nd dose at 2 mo 3rd dose at 6 mo (through a combined vaccine)
- Administer of 4 doses is permissible when combination vaccine used after the birth dose

Common reaction

- Pain and erythema at the injection site
- Fever
- **Precaution**
- Infant weighing <2,000

Notes

- ▶ If mother is hepatitis surface antigen (HBsAg)-positive, administer HepB and 0.5 mL of hepatitis B Immune globulin (HBIG) within 12 hours of birth
- ▶ If mother's HBsAg status IS unknown, administer HepB within 12 hours of birth Determine the HBsAg status as soon as possible and if HBsAg-positive administer HBIG (no later than age 1 week)
- ▶ If mother IS HBsAg- negative , give the birth dose

Rotavirus (RV) vaccine

- In early childhood, the single most important cause of severe dehydrating diarrhea is rotavirus infection.
- The Pentavalent vaccine protects against rotavirus gastroenteritis.
- Live vaccine, Oral route
- Three doses; 2,4, and 6 months.
- administered between 6 and 14 wk of age,
- Maximum age for the final dose is 8 month

Hemophilus influenza type b vaccine

- It is indicated for prevention of invasive diseases caused by *H.influenza* especially meningitis, septicemia, epiglottitis, arthritis &cellulitis,
- Is administer at 2,4, 6mo, 18 mo ,4-6 yrs,through combined vaccine
- Side effect : fever

Vaccines with Selective Indications

▶ Influenza vaccine

- live attenuated
- Should be given annually to those children 6 mo of age or older who are at increased risk for severe influenza disease or its complications.

Indications

- Asthma, Chronic pulmonary diseases (e.g., cystic fibrosis), congenital heart disease, chronic renal failure...

▶ Pneumococcal polysaccharide vaccine(PPV)

Its 2 types

1- Polysaccharide protein conjugate for(PCV) <2yrs

2- Polysaccharide(PPV) >2yrs , single dose .

Indications

- Sickle cell disease
- For anatomic asplenia
- Nephrotic syndrome
- Renal failure
- Organ transplants
- DM

▶ Meningococcal polysaccharide quadrivalent vaccine

Its given (≥ 2 year)

Indications

- Include functional or anatomic asplenia,
- Terminal complement component or properdin deficiency
- Travel to geographic areas where disease is hyperendemic or epidemic,
- Control of outbreaks