

VACCINATION IN PREGNANCY

DR.DINI EDAPAZHATHIL

- Benefits of immunisation in pregnancy:
 - Protects the mother from infections
 - Protects the fetus, neonate and infant from infection- achieved through placental transfer of antibodies

- Ideally women should embark on pregnancy with pre existing immunity to common infective diseases
- Not only saves the mother from risks associated with acquiring infection during pregnancy, but also avoids potential risks of vaccination with a fetus growing in utero

- Need for vaccination may arise due to outbreak of infection or necessity to travel to an endemic area for a particular infective disease
- Hazards of maternal vaccination to a developing fetus is largely theoretical
- There is no evidence of fetal risks as a result of immunisation with inactivated virus or bacterial vaccines or toxoids

- Benefit of immunising a mother who is at high risk of infection usually outweighs the potential risk to the fetus
- Fetus acquires immunity for a variety of infections through transmission of antibodies from mother, before baby itself is vaccinated
- This protects baby in immediate neonatal period

Precautions for Vaccination

Conditions are:-

- Risks of serious adverse reaction due to vaccination may be a problem
- Ability of vaccine to produce immunity may be compromised
- Safety of the given vaccine is unknown

Contraindications

- When vaccine is known to cause serious maternal, fetal or neonatal adverse effects
- No vaccine should be given when a contraindication is present

Different Types Of Immunisations

- Active immunisation
 - Depending on the type of antigen used, vaccines may be
 - Live or live attenuated
 - Killed or inactivated
 - Live or live attenuated vaccines have the risks of fetal damage due to maternal viremia
 - Vaccines used are tetanus- diphtheria and influenza

- Passive immunisation

- Immunoglobulin therapy
- Post exposure prophylaxis in cases – varicella zoster immune globulin is given to exposed non immune subject to reduce morbidity
- Similarly given in cases with hepatitis A and B, measles or tetanus

Types of vaccines

Live vaccines	Live Attenuated vaccines	Killed Inactivated vaccines	Toxoids	Cellular fraction vaccines	Recombinant vaccines
•Small pox variola vaccine	•BCG •Typhoid oral •Plague •Oral polio •Yellow fever •Measles •Mumps •Rubella •Intranasal Influenza •Typhus	•Typhoid •Cholera •Pertussis •Plague •Rabies •Salk polio •Intra-muscular influenza •Japanese encephalitis	•Diphtheria •Tetanus	•Meningococcal polysaccharide vaccine •Pneumococcal polysaccharide vaccine •Hepatitis B polypeptide vaccine	•Hepatitis B vaccine

Live vaccines

- Live vaccines are made from live infectious agents without any amendment.
- The only live vaccine is "Variola" small pox vaccine, made of live vaccinia cow-pox virus (not variola virus) which is not pathogenic but antigenic, giving cross immunity for variola.

Live attenuated (avirulent) vaccines

- Virulent pathogenic organisms are treated to become attenuated and avirulent but antigenic. They have lost their capacity to induce full-blown disease but retain their immunogenicity.
- Live attenuated vaccines should not be administered to persons with suppressed immune response due to:
 - Leukemia and lymphoma
 - Other malignancies
 - Receiving corticosteroids and anti-metabolic agents
 - Radiation
 - pregnancy

Inactivated (killed) vaccines

- Organisms are killed or inactivated by heat or chemicals but remain antigenic. They are usually safe but less effective than live attenuated vaccines. The only absolute contraindication to their administration is a severe local or general reaction to a previous dose.

Toxoids

- They are prepared by detoxifying the exotoxins of some bacteria rendering them antigenic but not pathogenic. Adjuvant (e.g. alum precipitation) is used to increase the potency of vaccine.
- The antibodies produced in the body as a consequence of toxoid administration neutralize the toxic moiety produced during infection rather than act upon the organism itself. In general toxoids are highly efficacious and safe immunizing agents.

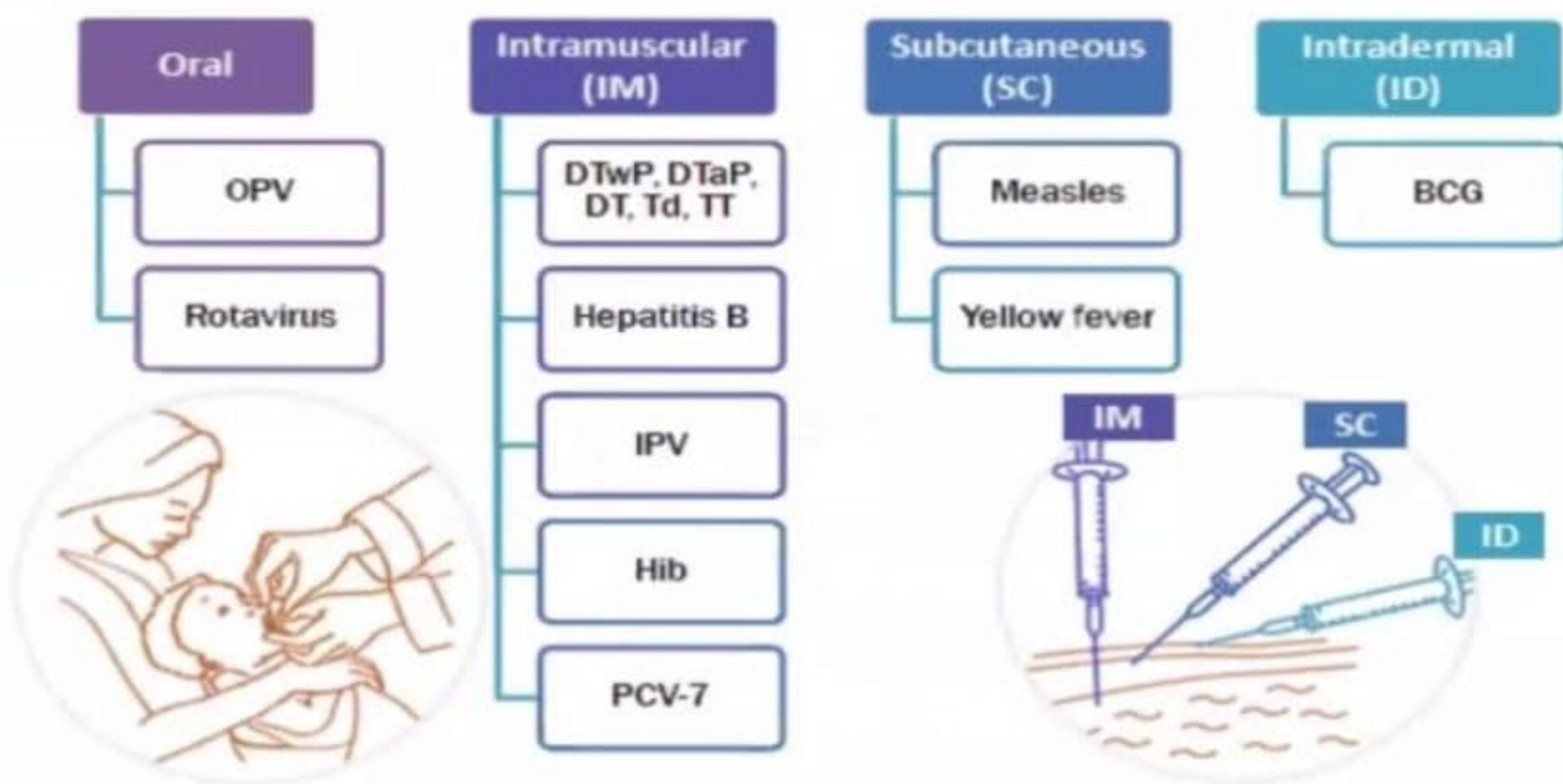
Polysaccharide and polypeptide (cellular fraction) vaccines

- They are prepared from extracted cellular fractions e.g. meningococcal vaccine from the polysaccharide antigen of the cell wall, the pneumococcal vaccine from the polysaccharide contained in the capsule of the organism, and hepatitis B polypeptide vaccine.
- Their efficacy and safety appear to be high.

Surface antigen (recombinant) vaccines.

- It is prepared by cloning HBsAg gene in yeast cells where it is expressed. HBsAg produced is then used for vaccine preparations.
- Their efficacy and safety also appear to be high.

3. Routes of administration



Differences between Live and Killed vaccines

Live Vaccines	Killed Vaccines
Only a single booster dose is needed	Multiple booster doses are needed
Less stable	More stable
Humoral and cell –mediated immunity	Mainly humoral immunity
May revert to the virulent form	Cannot revert to a virulent form
Small dose needed	Large dose needed

Vaccines that can be used with precautions

Poliomyelitis(Salk)	Live attenuated
Yellow fever	Live attenuated
Rabies	Live attenuated
Hepatitis A	Inactivated
Hepatitis B	Recombinant Inactivated
Typhoid	Parenteral: polysaccharide vaccine Oral: Live attenuated
Pertussis	Inactivated
Japanese encephalitis	Inactivated

Vaccine contra indicated in pregnancy

- Live or live attenuated vaccines are contra indicated in pregnancies
- BCG
- Mumps
- Measles
- Rubella
- Varicella
- Human papilloma virus
- Vaccinia

Vaccine preferably avoided during pregnancy

- Inactivated polio vaccine, Yellow fever and Rabies vaccines under normal circumstances should be deferred
- However when benefits outweigh risk this vaccines should be given
- Generally women should be advised to avoid pregnancy at least one month of vaccination

Risk when vaccines are used inadvertently

- Vaccina virus during pregnancy and breast feeding reported to cause fetal and neonatal infections
- No fetal or neonatal diseases have been reported till date with the usage of other vaccinations
- Not an indication for termination of pregnancy
- Ideally pregnancy should be avoided until 28 days after vaccination

- currently recommend two immunizations for all pregnant women without contraindication:
 - inactivated influenza
 - adult-type tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis (Tdap)

INFLUENZA VACCINE

- Pregnant women and infants are at increased risk of influenza-related morbidity and mortality and adverse pregnancy outcomes
- Influenza vaccination during pregnancy, regardless of pregnancy trimester, can significantly help prevent influenza virus infection among pregnant women and their infants younger than six months of age
- Vaccine should be given to all pregnant women regardless of trimester during flu season (Oct- May)
- Inactivated virus vaccine – one dose IM every year

Tetanus, Diphtheria and Pertussis(Tdap)

- Nature of vaccine- Toxoids
- One dose of Tdap during each pregnancy preferably between 27 to 36 weeks to maximize passive antibody transfer
- If Tdap vaccination is not given during pregnancy, and the woman has never received Tdap, it should be given postpartum

Tetanus and Diphtheria toxoids

- Pregnant women with unknown incomplete tetanus vaccine- 3 vaccination containing tetanus and reduced diphtheria toxoids should be taken
- Recommended schedule is 0,4 and 6 weeks through 12 months
- Tdap should replace one dose of Td preferably between 27 and 36 weeks

Covid Vaccine

- Recommended vaccines available in India
 - COVAXIN(Inactivated vaccine)
 - COVISHIELD(Non replicating viral vector platform)
 - SPUTNIK 5(Non replicating viral vector platform)
- All pregnant women should be vaccinated
- Two doses to be taken
- Interval between two dose of vaccine is same as for non pregnant adults
- If mother is covid positive ,leave 3 months gap before vaccination