

IMMUNIZATION

INTRODUCTION

Prevention of disease is one of the most important goals in child care. During infancy and childhood preventive measures against certain infectious diseases are available. Immunization recommendations change because of advances in the field of immunology. In the United States the recommended age for beginning primary immunizations of infants is within 2 weeks of birth or, in special circumstances, at birth

DEFINITION

Immunization is a form of preventive medicine. Its aim is to protect individuals and communities from infectious diseases. Immunization operates like an early warning system. It prepares the body to fight against infection.

Immunization is a way of protecting the human body against infectious diseases through vaccination. Immunization prepares the body to fight against diseases in case we come into contact with them in the future. The purpose of immunization is to improve the immunity power.

HOW DOES IMMUNIZATION WORK

Immunization operates on the premise that once you have had a disease, you are likely to contract it again. Through injections, oral drops or scratches on the skin, the body is exposed to weakened or dead disease producing microorganisms or to the toxins they produce. This will cause the individual to develop the same antibodies and antitoxins that would have been developed if the person had actually contracted the disease, in order to fight the disease. Once the body has been exposed to an infection, the immune system will recognize if the disease were to recur and produce antibodies or antitoxins to destroy the infection. The body has to be exposed to infection once for the immune system to recognize it. This is done through immunization.

TYPES OF IMMUNIZATION

Active immunization

It consists of including the body develop the defense against, by vaccines or toxoid that stimulate the immune system to produce antibodies and cellular immune response.

Passive Immunization

It consists of providing temporary protection through the administration of exogenously produced antibodies either from human or animal source. Passive immunization is term

experience useful only when exposure to infection has just occur or immune with in few days. Passive immunity is temporary lasting weeks to months.

Combined active and passive immunization

In some disease passive immunization is often under taken in connection with inactivated vaccine products, to provide both immediate passive immunity and slowly developing active immunity. If the infection is given separate site, the immune response to the active agent may or may not impair by immunoglobulin. But according to current recommendation immunoglobulin should not give within 3 weeks or until 2 weeks after administration of live attenuated vaccine.

Chemoprophylaxis

It implies the protection from or prevention of disease. This may be achieved by casual prophylaxis or by clinical prophylaxis. Casual prophylaxis implies the complete prevention of infection by the early elimination of the invading causal agent. Clinical prophylaxis implies the prevention of clinical symptoms; it does not necessarily mean elimination of infection.

VACCINE PREVENTABLE DISEASE

BCG VACCINE-

BCG (bacillus calmette Guerin) vaccine is a primarily used against tuberculosis. In countries where tuberculosis or leprosy is common, one dose is recommended in healthy babies as close to the time of birth as possible. The BCG vaccine is administered at birth in institutional deliveries or as soon as possible at birth. The standard site is the middle of deltoid muscle over the left upper arm. The vaccine is given using a special tuberculin syringe in intradermal route. The dose is 0.05 ml in neonate and 0.1 ml in infants. Complications following this vaccination are uncommon or may be mild. BCG immunization is contraindicated if the child is suffering from generalized eczema, infective dermatosis.

Polio

Oral polio vaccine was first described by sabin in 1957. It contains live attenuated polio virus of three strains. It is administered as trivalent vaccine.OPV is administered with zero dose at birth in institutional deliveries and then 3 doses at one month interval from 6,10,14 weeks. The dose is two drops or stated on the label of the vial and given orally. The contraindication of OPV include acute infectious disease, fever, diarrhea, dysentery.

HEPATITIS B VACCINATION –

Hepatitis B vaccination is now included in the immunization schedule, in some states of India as routine vaccine.Hep B vaccine are available in two forms: a) plasma derived vaccine b) RDNA yeast derived vaccine. Hepatitis B vaccine is given intramuscularly with the 3 doses

in general at 0,1,and 6 months or 4 doses at 0,1,2,and 12 months in highly endemic area. The dose of the vaccine is 0.5 ml for the child below 10 years and 1 ml above 10 years at the same interval.

ROTAVIRUS VACCINE

Rotavirus vaccine is a vaccine used to protect against rotavirus infections, which are the leading cause of severe diarrhea among young children. The vaccine prevent 15-34% of severe diarrhea in the developing world and 37-96% of severe diarrhea in the developed world.rotivirus vaccine is given in 3 doses at age 6, 10, 14 weeks. Dose is 5 drops and should be given orally.

INACTIVATED POLIO VACCINE-

Inactivated polio vaccine is the only polio vaccine that has been given in the United States since 2000. IPV is given by shot in the leg or arm, depending on the patients age. Inactivated Polio Vaccine are used to prevent paralytic poliomyelitis.IPV vaccine is given in 6 and 14 weeks. The dose is 0.1 ml. route of the IPV vaccine is intradermal. The inactivated polio vaccines are very safe.

PENTAVALENT VACCINE-

Pentavalent vaccine is a vaccine that contains five antigens (diphtheria, pertussis, tetanus and hepatitis B and hemophilus influenza type B). s per national immunization schedule pentavalent vaccine should be started for any child aged 6, 10, 14 weeks. Pentavalent vaccine are injected intramuscularly into opposite upper thigh muscle. Each dose is 0.5 ml to be given. Children's with moderate or severe acute illness should not be administered pentavalent vaccine unit their condition improves.

MEASLES-

Measles vaccine is the live attenuated and tissue culture vaccine, available as freeze dried product.it is safe and effective. The measles vaccine is administered at the age of 9 to 12 months. 2nd dose of measles vaccine is administered at the age of 16-24 months, before this age maternal antibody protects the infants. Single dose of vaccine is given with 0.5 ml amount in subcutaneous route.

It is a disease of the respiratory tract which begins with fever, cough, running nose and watery eye. The rash of measles is the characteristics of the disease, starting from the neck and quickly spreading to the trunk and limbs. The complications occur in a fair percentage of children who feel it. These include chest infections, fits, brain damage etc.

JAPANESE ENCEPHALITIS-

Japanese encephalitis vaccine is a vaccine that protect against Japanese encephalitis. The vaccines are more than 90% effective. Doses are given either by injection into a muscle or just under the skin. The first dose is given subcutaneously at age 9-12 months. Second dose is given at 16-24 months of age to the children's. Dose of the Japanese encephalitis is 0.5ml.

VITAMIN A -

Vitamin A is most commonly used for treating vitamin A deficiency. Vitamin A is required for the proper development and functioning of our eyes, skin, immune system, and many other parts of our bodies. The 1st dose of vitamin A vaccine 1ml is given at 9 month completed with measles orally. And 2nd dose of vitamin A vaccine 2ml is given at 16 months then 1 dose every 6 month orally.

DPT BOOSTER-

- Diphtheria

It is an acute infectious disease of childhood caused by bacteria. It usually manifests with sore throat and quickly progress to fever, headache and loss of appetite. Though the incidence of diphtheria has greatly reduced but it has not yet completely wiped out.

- Pertussis

Also associated with whooping cough is a highly contagious disease of the respiratory tract .It starts with features of a common cold but quickly progresses to a severe exhausting cough.

- Tetanus

The germs of tetanus are found in the soil. They can enter the body through a cut, a bruise or a prick of thorn. The toxin of tetanus acts on the nervous system which then affects the muscle causing severe stiffness of spasms. It is a very painful or distressing illness which if not treated promptly lead to death.

The booster dose of DPT vaccine is given at 16 to 24 months of age followed by another booster dose of DT vaccine at the age of 5 & 6 years without pertussis component. Each dose is 0.5ml and should be given deep intramuscularly.

TETANUS VACCINE-

Tetanus vaccine also known as tetanus toxoid is a toxoid vaccine used to prevent tetanus. The tetanus vaccine is given at 10& 16 years of age. Each dose is 0.5 ml and should be given intramuscularly.

REASONS FOR NOT IMMUNISING THE CHILD

- The child with high fever.

- If he had a bad reaction to another immunization.
- If had a convulsions in the past.(With the right advice children who have had fits in the past can be immunized)
- If he had or having treatment for cancer.
- If he had any illness which affects the immune system.(Eg:-HIV or AIDS)
- He is taking any medicine which affects the immune system, for immunosuppressant or high-dose steroids.

NATIONAL IMMUNIZATION SCHEDULE

VACCINE	WHEN TO GIVE	DOSE	ROUTE	SITE
FOR INFANTS				
BCG	at birth as early possible	0.1ml(0.05ml until 1 month age)	Intradermal	Left upper arm
HEP. B	At birth as early as possible	0.5 ml	Intramuscular	Anterolateral side of mid-thigh left
OPV-0	At birth	2 drops	Oral	-
OPV 1,2,3	6,10,14 weeks	2 drops	Oral	-
ROTAVIRUS	6,10,14 weeks	5 drops	oral	-
IPV	6&14 weeks	0.1 ml	intradermal	right upper arm
PENTAVALENT 1,2,3	6,10,14 weeks	0.5 ml	Intramuscular	Anterolateral side of mid-thigh left
MEASLES DOSE 1ST	9-12 months	0.5 ml	Subcutaneous	Right upper arm
JAPANESE ENCEPHALITIS	9-12 months	0.5 ml	Subcutaneous	Left upper arm

VITAMIN A 1ST DOSE	At 9 months completed with measles	1 ml	Oral	-
FOR CHILDREN				
DPT BOOSTER-1	16-24 months	0.5 ml	intramuscular	Anterolateral side of mid-thigh left
MEASLES 2ND DOSE	16-24 months	0.5 ml	subcutaneous	right upper arm
OPV BOOSTER	16-24 months	2 drops	oral	-
JAPANESE ENCEPHALITIS 2ND DOSE	16-24 months	0.5 ml	subcutaneous	left upper arm
VITAMIN A 2ND DOSE	16 months	2ml	oral	-
DPT BOOSTER-2	5-6 years	0.5 ml	intramuscular	upper arm
TT	10 years & 16 years	0.5ml	intramuscular	upper arm

SIDE EFFECTS OF VACCINATION

1. SIDE EFFECTS OF DPT VACCINE:-

Mild Problems (Common)

- Fever (up to about 1 child in 4)
- Redness or swelling where the shot was given (up to about 1 child in 4)

Soreness or tenderness where the shot was given (up to about 1 child in 4)

These problems occur more often after the 4th and 5th doses of the DTaP series than after earlier doses.

Sometimes the 4th or 5th dose of DTaP vaccine is followed by swelling of the entire arm or leg in which the shot was given, for 1 to 7 days (up to about 1 child in 30).

Other mild problems include:

- Fussiness (up to about 1 child in 3)
- Tiredness or poor appetite (up to about 1 child in 10)
- Vomiting (up to about 1 child in 50)

These problems generally occur 1 to 3 days after the shot.

Moderate Problems (Uncommon)

- Seizure (jerking or staring) (about 1 child out of 14,000)
- Non-stop crying, for 3 hours or more (up to about 1 child out of 1,000)
- High fever, 105 degrees Fahrenheit or higher (about 1 child out of 16,000)

Severe Problems (Very Rare)

Serious allergic reaction (less than 1 out of a million doses) Several other severe problems have been reported after DTaP vaccine. These include:

- Long-term seizures, coma, or lowered consciousness
- Permanent brain damage.

2. SIDE EFFECTS OF HEPATITIS B VACCINE

Hepatitis B is a very safe vaccine. Most people do not have any problems with it.

Mild problems

- Soreness where the shot was given (up to about 1 person 4)
- Temperature of 99.9°F or higher (up to about 1 person in 15).

Severe problems are extremely rare. Severe allergic reactions are believed to occur about once in 1.1 million doses.

3. SIDE EFFECTS OF Hib VACCINE

Most people who get Hib vaccine do not have any problems with it.

Mild Problems

- Redness, warmth, or swelling where the shot was given (up to 1 out of 4 children)
- Fever over 101 degrees Fahrenheit (up to 1 out of 20 children)
- children)

If these problems happen, they usually start within a day of vaccination. They may last 2 to 3 days.

4. SIDE EFFECTS OF MMR

Mild Problems

- Fever (up to 1 person out of 6)
- Mild rash (about 1 person out of 20)
- Swelling of glands in the cheeks or neck (rare)

If these problems occur, it is usually within 7-12 days after the shot. They occur less often after the second dose.

Moderate Problems

- Seizure (jerking or staring) caused by fever (about 1 out of 3,000 doses)
- Temporary pain and stiffness in the joints, mostly in teenage or adult women (up to 1 out of 4)
- Temporary low platelet count, which can cause a bleeding disorder (about 1 out of 30,000 doses)

Severe Problems (Very Rare)

- Serious allergic reaction (less than 1 out of a million doses)
- Several other severe problems have been known to occur after a child gets MMR vaccine. But this happens so rarely, experts cannot be sure whether they are caused by the vaccine or not. These include:
 - Deafness
 - Long-term seizures, coma, or lowered consciousness
 - Permanent brain damage

5. SIDE-EFFECTS OF POLIO VACCINE

Some people who get Inactivated Polio Vaccine (IPV) get a sore spot where the shot was given. The vaccine used today has never been known to cause any serious problems, and most people don't have any problems at all with it.

6. SIDE EFFECTS OF JAPANESE ENCEPHALITIS

- Fever
- Headache
- Low fever
- Chills
- Tired feeling
- Nausea
- Vomiting
- Stomach pain

SIDE EFFECT OF ROTAVIRUS

- Side effect are rare, usually mild, and may include,
- Fussiness
- Diarrhea and vomiting.

7. SIDE EFFECT OF BCG VACCINE

- Side effect occurs in 1-10% of vaccinated person and usually include severe or prolonged ulceration at the vaccinated site
- Lymphadenitis
- Lupus vulgaris
- Osteomyelitis in one case per million doses administered

8. SIDE EFFECT OF PENTAVALENT VACCINE

Mild Side Effect

- Soreness or swelling where the shot was given
- Fever

- Fussiness
- Feeling tired
- Loss of appetite
- And vomiting

Severe Side Effect

- Seizures
- Non stop crying for 3 hours
- High grade fever (105⁰ f)

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