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1. **Write a note on rabies and its prevention.**

Ans.

Rabies is an acute and fatal infection of the central nervous system caused by an RNA virus The virus is found in the saliva of the infected mammals and transmitted through their bites. Rabies is also known as hydrophobia,

- Classical hydrophobia is presented with long and variable incubation period with short period of illness due to encephalomyelitis ending in death
- It is always fatal
- Rabies free area is defined as one where no case of indig: enously acquired rabies infection hus been confirmed in humans or any animals during the previous 2 years. Such areas declared as rabies-free areas are New Zealand Australia, Japan, Taiwan, Finland, Norway and Sweden

Epidemiological Factors:

a. Agent Factors:

1. Agent: The causative agent is a bullet-shaped neuro tropic RNA containing virus called Lyssavirus type I belonging to Rhabdo viridae family with an average length of 180mm.
2. Reservoir of Infection: Rabies exist in three epidemiological forms

(a) Urban Rabies: It spreads through unimmunized dogs and cats to humans. A rabid dog is capable of biting a large number of humans and animals Dogs are the major reservoirs for the majority of cases of human rabies

(b) Wildlife Rabies (Sylvatic Form): Propagated by Wildlife animals such as skunks, foxes, racoons, mongooses and wolves. They transmit infections to domesticated animals or directly to the humans

(c) Bat Rabies: In certain Latin American countries hats are an important host and vector of rabies They feed on animal and human blood and are known to transmit rabies. Humans are affected especially when they sleep outdoors. Bats spread rabies either through bite or aerosol

3. Source of infections: Saliva of rabid animal is the major source of infection. It is also present in the CNS and excreted in saliva and urine for 34 days before the onset of symptoms and during the course of illness till death

B) Host Factors:

• Maximum in children less than 15 years

• Bites around face and neck are more dangerous All warm blooded animals and human beings aresusceptible to rabies

• High risk groups include veterinary workers, animal handlers, forest staff, hunters and lab staff working with virus

Mode of Transmission:

1. Animal Bite: Most cases of human rabies result from dog bites. As a prerequisite to transmission, the saliva of the biting animal (dog) must contain the virus at the time of bite.

2. Licks: The virus is introduced through wounded or abraded skin or mucous membrane when an infected animal licks another animal or man. Dogs usually have the habit of licking. From the skin, it travels along the nerve sheaths to the CNS, from where it finally reaches along the nerves to the salivary glands.

3. Aerosols: This kind of transmission has been seen in caves harbouring rabies infected bats and in laboratory where aerosols are created during homogenization of infected animal brains

4. Person to Person: Rare but possible. Transmission of rahies by comeal or organ transplant has been reported

Incubation Period:

It is 3-8 weeks after exposure but may vary from days to several years. Incubation period depends on various factors such as

- Site of bite and distance between site and brain
- Severity of bite

- Richness of nerve supply to that part
- Number, size and depth of the wound and amount ofvirus injected
- Species of the biting animal (jackal bites are worst) (the Physical condition of the patient (haure skin or through cloth)
- Age of victim (children have faster onset)
- Antirabies vaccination and promptness of local treatment

Clinical Features:

1. Prodromal symptoms include:
    - Headache, malaise, sore throat
    - Fever lasting for 34 days
    - Pain or tingling sensation at the site of bite

2. Prodromal stage is followed by widespread excitation of all parts of nervous system. It follows an order sensory system, motor system, sympathetic system and mental system. This is the stage of acute encephalitis

- The patient becomes sensitive to light, noise, touch and even currents of air
- Confusion, hallucinations, muscle spasms, meningism, convulsions take place
- Autonomic symptoms develop. perspiration. saliva-tion, lacrimation, pupillary dilatation and hypotension
- Hypoxia, hypocapnia and hyperventilation gradually turn to n hypoventilation and apnoea

3. Stage of brainstem dysfunction

- Hydrophobia appears (50% of cases) due to painful violent involuntary contraction of diaphragm, respi- ratory, laryngeal and pharyngeal muscles, initiated by swallowing of liquids
- Gradually sight, smell and sounds of liquids induce spasms • Convulsions and maniacal behaviour • Patient may into com
- Death may occur due to respiratory arrest, convulsion or choking

4. Stage of paralysis:

- If the person survives the cartier stage, paralytic symptoms supervene later, where muscle spasms cease

- There is apathy, stupor, coma and generalized flaccidity
- Death from heart failure or hypoxia occurs

Prevention and Control of Rabies:

There are three main ways of preventions

- Local treatment
- Vaccination
- IG administration

A) Local Treatment:

It includes categorization of the wound for further treat ment accordingly. The categorization is as follows:

i. Category 1 exposure:
    - touching or feeding of animals and ticks intact skin
    - Management: No treatment require

(ii) Category 2 exposure:

- Nibbling of uncovered skin
- Minor scratches/abrasion with no bleeding
- Licks on broken skin
- Management: Wound treatment and modern tissue culture vaccine.

(iii) Category 3 exposure:

• Single or multiple transdermal bites

• Scratches with bleeding

• Contamination of mucous membrane with saliva

. Exposure to bats

Management: Wound treatment, modem tissue culture vaccine and rabies IG.

Local Treatment Includes:

(a) First Aid by Victim/Attendant:

- Immediate washing the wound, scratches and ad- joining areas with plenty of soap and water (running Lup) for at least 15 minutes. It removes all before it can be absorbed on nerve endings
- Chemical treatment should be given by applying 70% ethanol or tincture iodine or aqueous iodine after washing the wound

(b) Treatment by Doctor:

• Antirabies IG should be applied by instilling in the wound and infiltrating around the wound

• Suturing should not be immediately done as it may cause additional trauma leading to spread of virus into deeper tissues, it should be done after applying IG locally

• Antitetanus treatment and antibiotics should be started to control infection when indicated

B) Vaccination:

Rabies is a disease where active immunization is done after man becomes infected. Antirabies vaccine (ARV) should be administered as soon as there is exposure cate gory 2 und 3.

It can however be stopped in two instances

• If the unimal remains healthy throughout the observation period of 10 day

• When animal is killed and found to be rabies free in laboratory test

Three types of vaccines are available. They are as follows:

(i) Nerve tissue based vaccines prepared from fixed vi roses grown in brains of adult sheep or other animals It is now been phased out due to major side effects (neuroparalysis).

(ii) Duck Embryo Vaccine Not used in India, It is eco. nomical and easy to prepare One such vaccine is purifiel vaccine (PDEV) which is safe tissue culture vaccine.

(iii) Tissue Culture Vaccine: Derived from cells of non eural origin, these vaccines are safe and potent. Such Vaccines are human diploid cell vaccine (HDCV) and primary chick embryo cell vaccine (PCEV) The potency is at least 25 IU per dose.

Schedule for Vaccination:

1. Intramuscular 5 Dose Schedule: One dose of vaccine

(1 mL) cach on days 0.3.7. 14 and 28. All injections to be given in the deltoid or into anterolateral aspect of thigh in children and never into gluteal region.

2. Intramuscular Abbreviated Multisite Schedule:

(2-1-1 regimen) Two dose (1 ml cach) given one in night deltoid and other in left deltoid on day 0, followed by one dose each on days 7 and 21 to induce early anti body response if IG is not included in the treatment

3. Intradermal 2 Site Schedule: (2-2-2-2 regimen): It is used with PCECV, PVRV and PDEV. The volume of ID dose is one fifth the IM dose per site. Two doses are given on day 0, 3, 7 and 28 on upper arm over each deltoid.

4. 8 Site Intradermal Method: (8-0-4-0-1-1 regimen): On day 0, one fifth of intramuscular dose is given at eight sites using the contents of whole vial. On day 7, same dose is given at both deltoids and thighs. On day 30 and 90, single dose is given over deltoid.

C) Antirabies Immunoglobulins:

In category 3 exposure, IGs along with vaccines are recommended. IGs should be given in a single dose of 20 IU per kg of body weight when human antirabies IG is used and 40 IU per kg of body weight when heterologous IG is used

- IG may be given at the same time as first dose of antirabies vaccine at different site.
- RIG is infiltrated into all wounds, as much as possible into and around the wounds, and remaining IG is given i.m. at site away from vaccine site.

2. Write a note on Pulse Polio Programme.

Ans.

Poliomyelitis is an acute viral infection caused by RNA virus that primarily affects the alimentary canal. It also affects CNS in small percentage resulting in varying degree of paralysis and even death.

Since 1954, extensive use of polio vaccines eliminated the disease in developed countries. In 1988, World Health assembly pledged to eradicate poliomyelitis globally. Vaccination against Polio in India was started in 1978 with Expanded Programme of Immunization (EPI).

In 1988, India launched its Pulse Polio Immunization Programme. Pulse Polio Immunization (PPI) programme is the largest ever conducted programme immunization in the world.

In Delhi, first PPI was organized in 1994 and National Government followed it in the year 19951996.The first round consisted of two pulses on 19 December 1995 and20 January 1996. It targeted children below 3 years from second round, children below 5 years were covered.

Seven series of National Immunization Days (NIDs) have been conducted in 2001-2002. A pulse office was formed in Delhi in 1989.

In the second round about 120 million children were immunized each day (7 December 1996 and 18 January 1997).

The target was to certify India to be polio-free by December 2005. On 27 March 2014, India was officially declared 'polio-free' by WHO as India has been officially recorded 3 years without a new case of polio.

It refers to sudden, simultaneous, mass administration of oral poliovirus vaccine (OPV) on a single day to all Immunizing children on NIDs at national level

- Ensuring VVM on each vial
- Identifying missing children
- Keeping eye on each case of polio through effective
- surveillance at national level

•Conducting special mopping up rounds in areas where polio virus has been detected • Publicity and mass awareness about PPI days

Difficulties in PPI:

- Testing shows three doses of OPV is not enough for children belonging to weaker section of the society due to reasons such as open defecation and monsoon flooding
- Increased number of drops and cases of polio among partially vaccinated children caused rumours among parents that the drops did not work

- Areas are remote and hard to access
- Preparation of PPI begins too fate
- Problems occurs if vaccines are ordered too late
- Unclear delineation of responsibilities

•Inadequate awareness about PPI in masses

•Inadequate distribution of vaccines and insufficient man power at the centres

- Inadequate transport facilities to supply vaccines.
- Long lines of vaccine booths, or booths opening up later not opened during lunch hours for convenience of working parents

Current PPI:

The pulse polio dates in 2017 were January 29 and April 2on Sundays, Health department visited houses on 30 and 31 January, and 3 and 4 April to ensure that drops were administered to all children below 5 years of age.

Objectives of Current PPI :

- Increasing booths and total coverage of OPV
- Increasing awareness in community through media
- Popularizing strength of routine immunization
- To ensure that all children in targeted areas receive routine PPI
- Prepare for emergency, rapid and effective response to any wild case of polio virus

* Full and consistent coverage of migrant and mobile populations

Support for PPI:

- PPI is supported by organizations such as Indian Federal and State Government, International Institution and various NGOS
- . It is a part of Global Polio Eradication Initiative ,headed by UNICEF

* Actor Amitabh Bachchan volunteered for campaign filming, TV and radio spots

- Indian and Alghun Cricket Team have also supported the program 0-5 years of age, regardless of previous immunization.

3. (a) List the intestinal infection. (b) Describe epidemiology of poliomyelitis.

Ans.

(a) Intestinal Infection

This mainly includes:

- Diarrhoea
- Amoebiasis
- Cholera
- Dysentery
- Helminthiasis
- Shigellosis
- Enterocolitis
- Salmonellosis
- Enteritis
- Bacterial gastroenteritis
-

(b) Poliomyelitis

- It is an acute viral infection caused by an RNA virus
- It is an infection of human alimentary tract but virus may infect the CNS in very small percentage (about 1%) of cases resulting in varying degree of paralysis and possibly death
- Problem Statement:
- In prevaccination era polio was found in all countries of the world
- Extensive use of polio vaccine since 1954 eliminated the disease in developed countries
- Since the implementation of eradication strategies by WH (World Health) Assembly, there is reduced number of polio endemic countries:

- 125 in 1988 -3 in 2012 (ie. Afghanistan, Pakistan and Nigeria)
- As of 25 February 2012. India was removed from list of polio endemic countries by WHO
- Another 2 years polio free would consider India or
- certify as polio-free country Epidemiological Determinants:
- Agent Factor
- Agent
- Reservoir of infection
- Infectious material
- Period of communicability
- Host Factor
- Age

- Sex
- Risk factor
- Immunity
- Environmental Factor
- Mode of transmission
- Incubation period • Clinical spectrum
- Agent Factor:

oAgent:

- Causative agent has three serotypes: 1, 2, 3
- Most outbreak of paralytic polio dye to type-1 • Well-adapted for faecal-oral route of transmission
- Vinus rapidly inactivated by: . Pasteurization oPhysical and chemical agent

oReservoir of Infection: • Man is only known reservoir

- Most infections are subclinical
- .It is estimated that for every clinical case, there may be 1000 subclinical case in children and 75 adults

- . No chronic carrier
- .No animal source has yet been demonstrated (e) Infectious Material:
- Virus is found in faces and oropharyngeal secretions of an infected person. (d) Period of Communicability:
- Cases are most infectious 7-10 days before and after onset of symptoms
- In facces, virus excreted commonly for 2-3 weeks sometimes as long as 3-4 months • Host Factor:

  oAge:

- Occurs in all age groups, but children are more sus
- ceptible than adults because of acquired immunity
- in adult population
- In India, polio is essentially a disease of infancy and
- childhood
- Most vulnerable age is between 6 months and 3 years oSex:
- Sex difference has been noted in ratio of 3 male:1 female (c) Risk Factor:
- Many factors may precipitate an attack of paralytic polio in individual with polio virus infection. These • include:
- Fatigue
- Trauma

Operative procedures – ttonsillectom

- Intramuscular injection

  oImmunity:

- Material antibodies gradually disappear during fisrt 6 months of life
- Reinfection can occur since infection with one type
- does not protect completely against other two types of virus
- Type 2 virus appears to be most effective antigen • Neutralizing antibody is widely recognized as an important index of immunity to polio after infection
- Environmental Factors: • More likely in rainy season
- Approximately 60% cases reported in India were during June to September
- Environmental source of infection is contaminated water, food and flies

- Polio virus survives for long time in cold environment • Overcrowding, poor sanitation provide opportunities to infection
- Mode of Transmission: (a) Faecal-oral Route:
- Main route in developing countries
- Direct through contaminated finger if hygiene is poor Indirect through contaminated water, milk, foods, flies and articles of daily use
- (b) Droplet Infection:
- May occur in acute phase of disease when virus occurs in throat
- Close personal contact with infected person facilitates
- droplet spread
- It is more important in developed faecal transmission is remote
- Incubation Period:
- Usually 7-14 days (range 3-35 days)
- Clinical Spectrum: When individual is susceptible to polio, one of the following responses may occur (a) Inapparent Infection:
- Occurs in approx 91%-96% of polio infection
- .No presenting symptoms • Recognition only by virus isolation or rising anti
- body titre
- (b) Absolute or Minor Illness: . Occurs in approx 4%-8% of polio infection
- Causes only mild or self-limiting illness due to
- viraemia
- Recognition by virus isolation or rising antibody titre (c) Nonparalytic Polio:
- Occurs in approx 1% of all infections
- Features: stiffness and pain in neck and back .Disease is synonymous with aseptic meningitis
- (d) Paralytic Polio:
- Occurs in <1% of infections
- Virus invades CNS and causes varying degrees of
- paralysis
- Predominant sign - asymmetrical flaccid paralysis • History of fever at the time of onset of paralysis

  is

- suggestive of polio
- Other associated symptoms:
- Malaise
- . Nausea
    - Anorexia oVomiting
    - Headache
- . Sore throat
- Constipation oAbdominal pain
- Tripod sign may present, i.e. child finds difficulty in sitting and sits by supporting hands back and by partially flexing hips and knees.
- Deep Tendon Reflex (DTRs) may get diminished before the onset Si paralysis.

4. Differentiate between rate and ratio.

Ans.

Rate:

Rate is referred to the quantity, amount or frequency of the occurrence of an event

It is expressed as number of times it happens for each thousand of the total population that is being studied

Rate is the comparison between two measurements of the same units

Rate refers to fixed quality of two things

Rate indicates changes in their measurements/units

E.g.

Maternal mortality rate = Maternal death rate÷women of reproductive age

Mortality rate = Deaths÷population

Ratio:

Ratio is referred to the relationship among the amount, size, number or degree of two or more similar things quantities

It is expressed as quotient of one thing quantity divided by other

Ratio is the proportion of one thing to another

Ratio refers to the relationship between various things

Ratio indicates difference between things

Eg

Sex ratio (1000: 990)

i.e. 1000 boys: 990 girls or

1000 boys. 1000

OR

990 girls. 990

5. Write a note on Ebola and its prevention.

Ans.

Ebola virus disease (EVD), also known with other name as Ebola haemorrhagic fever (EHP) or simply Ebola, is a severe haemorrhagic fever which could turn fatal if not treated due to multiorgan failure and bleeding complications.

Hailing from an unknown origin, the disease first appeared in two outbreaks, one is now known as NZara, South Sudan and the other is Yambuku, Democratic Republic of Congo in 1976. Another reported outburst occurred in the village near the Ebola River, descending its name from it.

Epidemiological Determinants:

A. Agent Factors:

(i) Agent: Ebola virus contains single-stranded negative RNA linear genome. It is about 18-19 kb in size and encodes seven genes (NP. VP35, VP40, VP30, VP24, L and GP), which belong to the family of Filoviridae.

(ii) Reservoir of Infection:

It is not yet known. But initial source of the disease is believed to be spread from animals to humans involving direct contact with infested wild animal or fruit bat of Pteropodidae family (main reservoir of infection)

(iii) Source of Infection:

- Through contact with infected fruit bat and in termediate hosts such as pigs and monkey that were infected through bat's saliva or faeces
- Direct contact with blood or body fluids of in fected animals or humans
- Infected syringes or needles
- Body of deceased person

(iv) Period of Infectivity:

1-21 days after the appear ance of symptoms. The person remains infectious as long as the virus resides in the blood and body fluids of the person.

B. Host Factor:

(i) Age/Sex: Exposure patterns differ by age and sex – women and children are more susceptible to the infection. Children below 5 years of age have high fatality rate.

(ii) Immunity: It Interferes with the innate immune system. It rapidly spreads over the body by inhibiting the immune responses.

(ii) Pregnancy: Infected pregnant women appear to be at greater risk of fetal loss. In recent outbreaks, infants born to infected women did not survive.

C. Environmental Factors:

- High humidity and low temperature
- Overcrowding
- Seasonal migration of fruit bats

Mode of Transmission:

• Direct Contact. With the infected blood and body fluids (saliva, mucus, faces, sweat, tears, vomit, breast milk, urine and semen) of humans

• Contact with blood and body fluid of infected animals such as apes, gorillas and chimpanzees

• Virus enters the body through mucosal surfaces, abrasions and injuries in the skin or by direct parental transmission

• It is not transmitted through air-bone carriers such as infected aerosols Potential contact with body fluids from patients who have died from EVD contributes to it widespread

Incubation Period:

It is 2-21 days, but the period shortens in immunocompromised people

Clinical Features:

Initial Symptoms:

• Fever

• Headache

• Fatigue

• Sore throat

• Pain in muscles

Later Symptoms:

• Anorexia

• Nausea

• Rashes

• Cough

• Postural hypotension

• Confusion

• Diarrhoea

• Vomiting

• Abdominal pain

• Dyspnoea

• Oedema Coma

Haemorrhagic complications include:

- Bleeding (nasal from venipuncture site, mucosa)
- Blood in vomiting, stool Petechiae, ecchymosis
- Convulsion, shock leading to multiple organ failure
- Death

Diagnosis:

Diagnosis is done using following diagnostic methods:

• Antibody capture ELISA

• Antigen capture detection tests

• Reverse transcriptase PCR assay

• Electron microscopy

• Viral isolation by cell culture

• Automated or semi-automated nucleic acid tests (NAT)

for routine diagnostic management.

Prevention:

1. **Infection Control:**

• Reducing the risk of wildlife to human transmission from contact with infected fruit bat or monkeys/apes and the consumption of their raw meat which is the known source of infection Animal food should be thoroughly cooked before consumption.

• Reducing the risk of human to human transmission by wearing personal protective equipment and fol. Lowing standard precautions while caring those who are infected with Ebola. It includes the following:

- Wish Hands: Five moments of hand washing should be adopted while caring for any susceptible patient
- Isolation of the patient: Separating the infected one from the ones who are not contributes in de creasing the secondary attack rate: quarantine or enforced isolation results in decreased spreading .
- Wearing PPE: It includes mask, gowns, gloves and goggles to leave no skin exposed while caring an infected person
- Dispose of waste properly. All equipment, soiled fomites (clothes, linens), medical waste and sur faces coming in contact with the blood and body fluid of the infected individuals need to be properly disposed or disinfected
- Dispose of needles: Needles and syringes should be disposed appropriately. Needles should be disposed in puncture proof white containers while syringes should be disposed off after single use by breaking it in appropriate bag.

2. **Safe Burial Practices:**

Proper burial of the dead and identifying the infected could prevent its further spread and could prevent an outbreak.

3. **Reducing the Risk of Possible Sexual Transmission:**

- Safe sex practices and hygiene has been an effective measure to turn the test of Ebola virus negative.
- Ebola virus can be inactivated by heating for 30 to 60 minutes at 60°C by using lipid solvents such as alcohol based products, sodium hypochlorite/calcium hypochlorite to disinfect equipment or surfaces.
- Avoid travelling to countries affected by Ebola virus or where an outbreak has occurred

6. Discuss the role of nurse in prevention of chickenpox.

Ans.

Chickenpox or varicella is an acute, highly contagious disease caused by varicella-zoster virus (V-Z Virus). It is presented with sudden onset of fever, malaise and vesicular rashes appearing on the first day of illness.

Epidemiological Determinants

1. Agent Factor:

(a) Agent: Varicella-zoster virus is also called human herpes virus 3. The virus may persist in latent form after primary infection.

(b) Source of Infection: Case of chickenpox. The virus is present in oropharyngeal secretions and lesions of skin and mucosa. The virus is isolated from vesicular fluid during first 3 days. Scabs are noninfective. (c) Period of Infectivity: 1-2 days before appearanceof rash and 4-5 days thereafter.

(d) Secondary Attack Rate: Highly communicable,the secondary attack rate in household contacts is 90%.

2. Host Factor

(a) Age: Mostly occur in children below 10 years of age, equal in both genders, more severe in adulthood (b) Immunity: Single attack gives lifelong immunitywith primary infection being symptomatic

(c) Pregnancy: Infection during pregnancy presents a risk for the fetus and neonate.

(d) Environmental Factor: Chickenpox shows seasonalvariations in India being active during first six monthsof the year. Factors that favour its transmission areover-crowding (home, school or workplace) Incubation Period: 14-16 days (ranging from 10 to 21 days). Incubation period shortens in immunocompromised people.

Transmission:

• Man is the only reservoir

• Chickenpox is transmitted from person to person by droplet infection and droplet nuclei through face to face contact

Another source of infection is the fomites and fluid in vesicles of varicella (lesions)

• The virus can also cross the placental barrier and infect the fetus causing congenital varicella

Clinical Features:

Chickenpox infection appears 10-21 days after expo sure to the virus and usually lasts about 5-10 days. The rash is the definite indication of chickenpox. Other signs and symptoms, which may appear 1-2 days before the rash. include

• Fever

• Loss of appetite

• Headache

Tiredness and a general feeling of being unwell (malaise)

Prevention:

Prevention consists of: Isolation of patient

• Care of exposed individual

• Active immunization

1. Isolation of Patient:

• Isolation of patients or children from school/day carecentre for 6 days after the appearance of the rash and disinfection of articles soiled by nose and throat dischargesImmunocompromised patients should be isolated till the vesicles have crusted

• Persons caring for infected individuals should practice hand washing strictlyIsolation of case of chickenpox for the duration ofvesicular eruption in hospitals

• New born to mothers with active chickenpox should be isolated for 3-4 weeks of age

2. Care of Exposed Individual:

Varicella-Zoster Immunoglobulin (VZIG) is a dose of 15-20 units/kg body weight im within 72 hours of exposure, effective in preventing the disease or modifying it in exposed susceptible cases. These include:

- Immunocompromised patients
- . Susceptible pregnant women

    Newborn born to mother with active varicella Household contact residing in the same house

Face to face contact for at least 5 minutes Hospital contact with varicella active patient in the same room

- Premature infants of LBW

- Persons receiving immunosuppressive therapy - A repeat dose of VZIG is to be given in 3 weeks if a high risk patient remains exposed

. VZIG should not be given along with varicella vaccine as they appear to bind with each other . Minimum dose for newborn is 125 units administered as soon as possible after birth

* In older children dose is 125 units for each 10 kg body weight administered within 48 hours of

exposure

3. Active Immunization:

A live atteuated varicella virus vaccine developed in Japan in 1974 is a safe and effective vaccine for children between the age of 12 and 18 months who never hadchickenpox. Children 12 months to 12 years receive a single vaccine dose, while adolescents and adults require two vaccine doses, a minimum of four weeks apart.The length of protection from this vaccine is not known clearly. Clinical trial shows protection from varicella vaccine lasts for 25 years Japanese date) and 14 years (US data)

Idications:

All susceptible individuals:

- Health care providers

• Household contacts of immunosuppressed individuals Teachers in elementary school or day care centre

- College students
- Non pregnant women of child bearing age

Contraindications:

It includes:

• Immunodeficiency

• Symptomatic HIV

• H/O anaphylactic reactions from vaccine components

• Pregnancy

• Peron allergic to neomycin

Severe illness or person on steroids

Postexposure Immunization:

If the vaccine is administered within 3 days after expo sure to V-Z virus, a postexposure protective efficacy of at least 90% can be expected. If chickenpox occurs, it is a very mild case with fever lesions, mild or no fever and quicker recovery.

Adverse Effects:

• Local swellings

• Redness

• Tenderness at site of injection

• Fever in 10%-15% cases

• Localized maculopapular or vesicular rash in 5%cases

7. Write a note on measles and its prevention.

Ans.

Measles is a highly contagious disease of childhood caused by a virus belonging to the paramyxovirus family. It is pre sented with fever, upper respiratory symptoms and maculo papular rashes starting on 5th day of illness.

Measles occur only in humans and has high mortality and morbidity rate in developing countries. Measles is a worldwide endemic disease. Complications are morecommon in children below 5 years and adults above 20 years of age

Epidemiological Factors:.
A) Agent Factor:

(I)Agent: Measles is caused by an RNA paramyxo virus . The virus cannot survive outside the human body
(ii)High Source of Infection: Case of measles Man is the natural host and source of infection Carriers do not exist.

(iii) Period of Communicability: 4-5 days before and 5 days after the appearance of the rash
(iv)Spread of Infection: It spreads through the respiratory route from infected patient through Normal susceptible person through the small droplet of nuclei. Direct person to person may also spread disease.

(v) Secondary Attack Rate: Infection confers life long immunity.
(B) Host Factors

(i) Age: It mainly occurs in children between 6 musthe and 3 years of age. Although the age is exempted from it but 80%occurs in under five
ii) Sex: Both sexes are all equally affected but complications are more in male.

(iii)Immunity: One attack of measles gives lifelong immunity. Second attack is rare. lmmunization with measles vaccine provides solid and long-lasting immunity.

(iv)Nutrition: Meades causes high mortality mal- nourished children (up to 400 times bigger Mal- nourished children are seen to excrete measles virus for a longer period than the nourished children prone to nutrition after one severe attack

C) Environmental Factors:.

(I) Measles occur more in winter and spring months.

(ii)Overcrowded areas such as urban slums

(iii)Low socioeconomic conditions

Mode of Transmission:

• Droplet Infection: Transmission occurs through droplet nuclei and droplet infection during the period of compatibility. Secretions from nose. throat and respiratory tract spread infection.

Infection can also occurs through conjunctiva as the virus instilled in conjunctiva can cause infection

Incubation Period:

It is 10-14 days . It is shortened in cases where measles is artificially induced by passing the respiratory tract.

Clinical Features:

There are three stages in which measles symptoms appears

1. Prodramal Stage: it takes 10 days after last till 14th day . It ispresented with fever, dry hacking cough, running nose, snoring, redness of the eyes and excessive lacrimation.

There may be vomiting or diarrhoea Koplik spots appear on the inner side of the cheek, opposite the lower molar teeth .On 2nd and 3rd day of illness, they are small blush white spots on a red base, smaller than the head of a pin.

2. Eruptive phase:

This phase is presented with typical, dusky red macular or maculopapular rash behind the ears gradually spreading down the body. Within 3days, it spreads to trunk and extremities Rash is erythematous and gets blanched in pressure. The rash fades away in the same order of appearance leaving brownish discoloration which does not fade and last for 2 months or more . This is because of staining of the skin following capillary haemorrhage Fever lasts for about weeks in uncomplicated cases, anorexia and malaise

In case of haemorrhagic measles:

-High fever

-Convulsions

- Delirium

-Stupor

- Belching from mouth, nose and bowel

-Come and death

3. Post Measles Stage

Child losses weight and become Weak

Failure to recover may leads to other chronic illness and increased susceptibility to opportuninistic infection

• Growth retardation and diarrhea and the reactivation of TB may occur

Prevention and Control

1. Active immunization : Measles can be prevented hy achieving immiunization level of 95% and continuing immunization of children of succesive generation, As per National Immunization Schedule.before 9 month child has natural immunity

. Immunization is done at the age of 9 months with a single dose of 0.5 ml. live attenuated vaccine subcutaneously, Immunity develops after 11-12 days of vaccination and provides 95% protection.Before 9 months, child has natural immunity required from the mother

• The vial once opened should not be used and 4 hours of its opening and it causes adverseeffects measles vaccination can be given in combination with the attenuated vaccines for mumps and rubella (MMR)

The triple vaccine is also found to be highly effective
Contraindications:
-Pregnancy

-H/O anaphylactics reaction to egg protein or neomycin

-Immunocompromised people.

-people receiving radiations and corticosteroids

2. Passive Immunization

Human immunoglobulin (IG) is given within 3-6 days of exposure to prevent measles, in close of 0.25 mL/kg body weight, intramuscularly. It can be given to individuals in whom live attenuated vaccine is contraindicated such as immunocompromised people, pregnant women and chil dren below 1 year.

3. Other Preventive Measures Include:

Infected children or those suspected of measles should be isolated before the appearance of rashes and 7 days after appearance of rashes

• Keep other children away from the ones having measles

• Prompt immunization of contacts within 2-3 days of exposure

• IG should be given within 3 days of exposure in cases where vaccine is contraindicated

• Scheduled immunization.

• Health education about importance of immunization,prevention and control of measles

8. (a) Causation of viral hepatitis. (b) Describe preventive measures and control measures you would suggest to prevent hepatitis.

Ans.

(a) Viral Hepatitis

• It may be defined as infection of liver caused by any of half a dozen viruses

• These are Hepatitis A, B, C, D, E, G

• Many other viruses may be implicated in hepatitis such as cytomegalovirus (CMV), Epstein-Barr virus, yellowfever virus and rubella virus

• Agent factor mainly includes the particular agent responsible for disease

• Host factor includes age, sex or immunity and risk groups

• Environmental factors include the surrounding hygieneand sanitation practiced.

Agent, host and environmental factors are as follows.

A	Hepatitis B	Hepatitis C	Hepatitis D	Hepatitis E

osahedral rus 7-32 nm in ameter Ian is the nly reservoir ource of fection is ainly ontaminated ood	• Hepatitis B virus • Oldest known • Man is the only reservoir • Source of infection is contaminate blood	HCV • Enveloped virus • Icosahedral • Source of infection ✓ Contaminated blood ✓ Injection drug use ✓ Contaminated syringe	HDV • Defective single-stranded RNA virus • Require helper function to HBV to replicate • Source of infection- contaminate blood	HEV • 27-34 nm • Nonenveloped • Icosahedral • Single stranded
ommon in hildren and ainly below years of age ny age roup can be ffected	• Age dependent • Acute hepatitis approx 1% perinatal 10% early childhood, 36% late HBV infections	• Transmitted parenterally • High risk group • Recipients of blood transfusion • Health care and lab personnel • Homosexuals • Prostitutes	• High risk group • IV drug user • Promiscuous homosexual and heterosexual group • People exposed to unscreened blood or blood products such as haemophiliacs	• Zoonotic origi is suspected a monkey, rats cattle, sheep • Reservoir i unknown • High attack rat in young adult • Pregnant wome in second an third trimeste are frequentl affected
ases occur roughout the ear oor nitation and vercrowding avour spread				

f infection				

(b) Prevention and Control

Hepatitis A:

As almost all hepatitis infections spread by faecal-oral route, following measures are important:

- Water supply should be safeguard against faecal contamination
- Water should be preferably boiled during an outbreak Sanitation should be kept at very high level
- Methods of proper disposal of human waste and strictantifly measures should be reinforced
- Personal hygiene must be maintained at an extremely high level; hand washing should be practiced strictly toprevent contamination
- Complete inactivation of HAV in food can be done bycomplete heating at 85°C for at least one minute
- In prophylactic measures for Hepatitis B following prevention should be done:
  - Safe sexual practices .
  - Use of condoms
  - Safe hygiene practices
  - Safe blood transfusions and injection safety
  - Practice of proper 'universal safety precautions .
  - Biomedical waste management as per laid downguidelines
- In case of Hepatitis C, there is no vaccine available, so the following precautions should

be done:

- Screening and testing of blood and organ donor
- Virus inactivation of plasma derived products
- Implementation and maintenance of infection control practices in health care settings
- Promotion of behaviour change among general public and health care workers to reduce overuse of injection and safe injection practices
- Risk-reduction counselling for persons with highrisk drug and sexual practices

- In case of Hepatitis D, coinfection can be preventedeither with pre-or postexposure prophylaxis for HBV
  - Education to reduce risk behaviours
- In case of Hepatitis E, almost all infections spread by faecal-oral route:
  - No vaccines are available
  - Preventive measures can be taken as:
    - Good hygiene
    - High quality of water supply
    - Proper disposal of waste
- In Hepatitis G, no vaccines are available:
  - Preventive measures are taken:
    - To reduce possible contact with contamination
    - Drug user should not share needles, syringe andother equipment

Active Immunization:

Hepatitis A vaccines are available internationally:

- Inactivated Hepatitis A vaccines are available
- Given i.m. as two dose series, 6-18 months apart

- Dose and schedule, paediatric and adult formulationsdepend on manufacturer
- No vaccine is available for <1 year old children
- A combination of vaccine inactivated Hepatitis A and recombinant Hepatitis B vaccine has been licensedsince 1996 for use in children aged one year or moreseveral countries
- Combination vaccine schedule - 0, 1, 6 month

Hepatitis B:

- Vaccine
- Safe
- Cost-effective

2 Types:

(1) Plasma Derived:

• Prepared from purified HBsAg from plasma of person with chronic HBV and inactivated using formalin. Aluminium phosphate and aluminium hydroxide are added as adjuvant.

• .i.m. administration Site: Anterolateral aspect of thigh (infants and children aged < 2 years)

• Deltoid muscle (older children and adult)

• Not recommended in buttock

(2) Recombinant:

• Yeast derived

• Use HBsAg synthesized in yeast or mammalian cells

Passive Immunization:

Hepatitis A:

- With IG that contains anti-HAV
- Recommended for postexposure prophylaxis forunvaccinated person who is exposed to HAV

- Single Dose i.m. (0.02 mL/kg)

Hepatitis B:

- Postprophylaxis using Hepatitis B. Immunoglobulin (HBIG) is indicated in following situations.

  • For newborn infant whose mother are HBSAG +ve

  • Following percutaneous or mucus membrane expo sure to HBsAg +ve blood or body fluids . Following sexual exposure to an HBsAg +ve person

  • To protect patient from recurrent HBV infection following liver transplantation

- IG (16% solution) should be given at the rate of0.02-0.12 mL per kg of body weight
- I.m. in two doses 30 days apart

HBIG should not be used as an adjunct to Hepatitis Bvaccine

9. Write a note on prevention of worm infestation.

Ans.

Worm Infestation is a major problem in children especially in developing countries due to poor living conditions and unawareness. These parasitic worms derive their nutrient from their hosts (humans or animals).

Most of the worms dwell in the intestines for at least one part of their lifecycle. It is along-term disease with few manifestations.

Types of Worm Infestation:

Among numerous species of worm in the world of different forms, shapes and sizes, the most common types of Worm Infestation that cause trouble in children are as follows:

• Tapeworm: Flat, ribbon-like worms that live in the intestine and can grow up to 15-30 feet.

• Roundworms: or nematodes resemble earthworms that can grow up to the size of 30-35 cm.

• Pinworms or Threadworms: They are fine white cot tony threads that live in the intestine and around the anus of the individual.

• Hookworms: They live in the small intestine mainly jejunum where they attach themselves to the villi. They are contracted through contaminated soil.

Symptoms of Worm Infestation:

Common manifestations presented in all kinds of worminfestation are;

• Blood in stool

• Stomach pain

• Irritability

• Weight loss

• Bed wetting

Specific symptoms to various worms include:

(i) Tapeworm Infestation:

• Nausea and vomiting

• Anorexia and weight loss

• Malnutrition

• Jaundice (common in tapeworm infection)

(ii) Roundworm Infestation:

• Diarrhoea with presence of worms in stool

• Fever

• Dry cough

(iii) Threadworm Infestation:

Itching around anus region. Itching is triggered by threadworm that come out during night and lay eggs near anal region.

• Trouble sleeping due to itching • •Painful micturation

(iv) Hookworm Infestation:

• Coughing, wheezing (when hookworm larvae at- tack lungs)

• Blood loss and depletion of body's iron stores lead ing to iron-deficiency anaemia

• Fatigue Loss of blood plasma leading to hypoalbuminaemia.

Causes of Worm Infestations:

Children being the most dynamic age group are more likely to come in contact with the germs. The main causes of Worm Infestation include the following:

(i) Contact with Contaminated Surface: Worms are commonly found in soil and have the ability to survive up to two weeks without feeding. Children acquire infection in playground or outdoor play in the soil. They may also contract it from touching pets or their excrement infected with worms.

(ii) Improper Hand Hygiene: Children are likely to put things in their mouth while playing that may be contaminated. Children also tend to scratch anal region due to itching, in case of pinworms, that causes eggs of the worms to come in contact with skin on hand. The scenario worsens when children put that hand back in the mouth due to habits such as thumb sucking or pleasure.

(iii) Improper Personal Hygiene: Prolonged stay in wet clothes, unwashed bedding or undergarments, dirt in the room, uncut nails or unwashed hands during preparation of food, can also lead to Worm Infestations.

(iv) Consumption of Contaminated Food or Water:Unwashed and raw fruits and vegetables may haveworms on them. Contaminated water is also a common source of worm infestation.

* Prevention and Control:

1. Primary Prevention:

•Frequently washing of hands thoroughly with soapand water

• If outside, where water facility is not available, use an alcohol based sanitizer

• Proper disposal of the human excreta to prevent or reduce faecal contamination of the soil

• Provision of safe, clean filtered or boiled drinking water

• Maintenance of personal hygiene that includes changing of undergarments daily, keeping nails shortand bathing daily, along with thorough cleaning ofprivate parts

• Wash or change bedding, pillow covers regularly

• Toys should be kept clean or washed as they may becarrying worms

• Wash and cook vegetables instead of eating them raw

• Washing hands thoroughly before preparing and eat ing the food and after going to the toilet bod

• Teaching children proper potty hygiene

• Using proper sanitary latrines and clean them regularly

• Wearing footwear

2. Secondary Prevention:

Effective drugs are available for the treatment of worm infestation. Drugs of choice are:

1. Albendazole: Single dose of 400 mg is given to adults and children over 2 years of age. It should not be given in pregnancy and children below 2 years.

2. Mebendazole: The usual dose is 100 mg twice daily for three days for all ages above 2 years. It can also be given as a single dose of 500 mg. Contraindicated for pregnant women and children below 2 years of age.

3. Levamisole: It is a laevorotatory form of tetramisole and more active than parent compound. It is considered as drug of choice. It is given as a single dose of 2.5 mg/kg of body weight with a maximum dose of 150 mg. There is usually no side effects and majorly used to treat round worm infection.

4. Pyrantelpamoate: Single dose of 10 mg/kg of body weight is effective and can also be given in divided doses of 10 mg/kg body weight daily for 3 days with maximum of 1 g.

10. Write a note on the universal precautions in prevention of AIDS.

Ans.

Universal precaution guidelines were developed for care of patients regardless of the infection status to prevent the transmission of infection during patient care.

1. Hand Hygiene:

Five areas of hand washing are

(i) Before touching the patient

(ii) Before performing a procedure

(iii) After performing the procedure or after exposure to body fluids/blood (iv) After touching a patient

(v) After touching the surroundings of a patient

- Wash hands after removal of the gloves, between patients and otherwise to avoid transmission of organisms from one patient to another
- Wash hands between procedures on the same person to prevent cross-infection of different body sites
- Use alcohol-based hand rub for routine hand washing
- Perform all the steps of hand washing for proper hand hygiene

2. Gloves:

- Wear clean, sterile gloves when touching blood, body fluids, secretions or contaminated items
- Wear gloves before touching mucus membrane or non intact skin
- Change gloves between each patient and each procedure on the same patient to prevent crossinfection
- Remove gloves promptly after use and dispose of before touching any non contaminated item or clean surface prop-
- Wash hands after removing the gloves

3. Other PPE (Personal Protective Equipment):

- Wear mask and eye protection to protect mucus membrane of eye, mouth and nose during procedures that are likely to cause splashes or spray of blood of body fluids.

- Wear a clean gown to protect skin and prevent spoiling of clothes during procedures that are likely to cause splashes or spray of blood or body fluids.
- Select a gown appropriate for the procedure and amount of fluid likely to be encountered
- Remove the soiled gown promptly and wash hands to pre vent contaminating other patients or environment surface
- Footwear coverings should be wore to protect feet from floors contaminated with body fluids and blood

4. Patient Care Equipment:

   - Patient's environment should be regularly disinfected and cleaned such as bed, side rails, bedside equipment and other surfaces that the patient comes in contact with.
   - Procedures must be followed properly with prompt dis infection using proper solution and techniques.
   - Soiled linens and clothings stained with blood and body fluids should be handled and transported in a manner that prevents skin and mucus membrane exposure and contamination of clothings and also prevents transfer of microbes from linens to other patients and clean environ mental surfaces.

5. Occupational Precautions:

   - Care should be taken while handling sharp objects and instruments, needles and scalpels during and after the procedures
   - Dispose the needles carefully in puncture proof containers
   - Handle the sharps carefully while cleaning them
   - Avoid recapping the needles or manipulating them that can cause needle stick injuries; never direct the needle towards any part of the body
   - Do not remove used needle from syringes by hand and do not bend, break or manipulate needles by hand

- Place reusable needles, syringes in puncture proof containers separately for transporting it to the sterilization unit
- Use mouthpieces, resuscitation bags or other ventilation devices as an alternative to mouth-tomouth resuscitation method in areas where resuscitation is predictable
- All the blood samples and body fluids must be put in a well-secured container that does not leak during transportation
- Mechanical pipetting devices should be used in laboratory and avoid mouth pipetting
- Disinfection of the working area if there is spillage of blood and other body fluids

6. General Precautions:

- Store soiled items in a plastic bag
- Place a container lined with plastic bag at the bedside of the patient and instruct the patient to put soiled items in it (contaminated with body fluids and blood)

- PEP (postexposure prophylaxis) is important to the health care workers who are exposed to HIV patient's blood and body fluids to reduce the chances of infections.
- In case of exposure, wash the skin with soap and water and allow it to bleed a few seconds before washing (though not forcefully allowing).

7. Patient Placement:

- Patients who are at high risk for transmission of disease, who cannot be expected to assist in maintaining appropriate hygiene, should be admitted in a private

11. (a) Explain natural history of diseases in causation of AIDS. (b) Discuss different levels of disease prevention and control of AIDS.

Ans.

(a) AIDS

Acquired immunodeficiency syndrome is described as fatal illness caused by retrovirus known as human immunodeficiency virus, which breaks down body's immune system.

History of Disease Causation:

Till decade before, infectious diseases ceased to be a major problem in developed countries. In early 1980s, situations changed

Retrovirus:

Like other virus it cannot replicate without taking over biosynthetic apparatus of a cell.

- Unique in their capacity to reverse ordinary flow of genetic information from DNA - protein
- With the help of reverse transcriptase viral RNA converted to DNA

DNA > RNA → protein

- RNA Reverse transcriptase DNA Genome of host Intent until activated to make new virus particles • Reverse transcriptase discovered up to mid-1970s: an Other infectious retrovirus was found in human being
- 1980 First human retrovirus HTLV-1 caused a rare, highly malignant cancer called adult and T-cell leukaemia, ie. Endemic in parts of Japan, Africa, Caribbean Islands spreading to other regions – 2 years later HTLV-2 was found out.
- HTLV –1, 2→ cause immune depressions AIDS cases were first recognized– hypothesis ice. AIDS could be a close relative to HTLV-1 but proved wrong. Search found HIV as cause of AIDS.

Spreading fast in America, Europe. Australia and Africa Asia appears to be affected last and least by HIV infection

About AIDS:

- First reported in 1981 in the USA
- Found by retrospective analysis in 1978 in the USA and in late 1970s in equatorial Africa

- According to WHO estimates, between 1 and 2 million Africans may already be AIDS carrier and 50,000 are not suffering from any disease
- First confirmed evidence of AIDS infection came in April 1986. Six prostitutes from Tamil Nadu were found +ve from HIV antibodies
- Changing trends in India indicate that HIV infection is spreading in two ways:
- Urban to rural areas
- From individual practicing high risk behaviour to General population

Revised estimate at National level are:

- 2.47 million people living with HIV
- In India:

0.28% adult (15-29 years) are infected

0.35% - urban

0.25% - rural

0.36% - male

0.22% - female

Because of injecting drug users the infection has spread very rapidly in Manipur with HIV prevalence >70%

Problem in India is spread uneven. More severe in Southern half of country and far Northeast

- Estimated prevalence:
- Manipur – L13%
- Andhra Pradesh – 0.97%
- Karnataka -0.69%
- Maharashtra -0.62%
- Tamil Nadu – 0.34%
- UP – 0.07%

Average HIV prevalence among women attending ante natal clinics in India -0.48%

- Much higher rates are found in:
- People attending STD clinics – 3.6%

. Female sex workers – 5:15

- Injecting drug users 7.2%

Men who have sex with men -7.4%

(b) Prevention and Control

- Preventing new HIV infections is a priority in any HIV control programme
- Other components in prevention programme include:
- Extensive HIV testing program
- Treatment of HIV infection and other STD in Community Various strategies of HIV/AIDS prevention include the following:

HIV vaccine

Antiretroviral prophylaxis

- Administration of antiretroviral therapy
- IEC

Prevention of blood-borne transmission

- HIV infected couple
- Safer sex
- Nutrition in HIV/AIDS
- HIV and health care worker
- Prevention of parent to child transmission
- Immunization of HIV infected children

TEC:

Information. Education and communication should promote

- Delay in first sexual encounter
- Reduction in number of sexual partner
- Safe sex through use of condoms

Prevention of blood-borne HIV transmission:

All blood banks must transfuse blood only after it has been tested and found -ve for:

- HIV 1 and 2
- HBSAG
- Malaria
- Syphilis
- And other as specified by National Blood Policy Strict sterilization practices should be ensured in hospitals and clinics Autoclaved syringes and needles and other instruments should be used
- Sharing of needles among drug users should be eliminated by health education

Antiretroviral Prophylaxis:

- Prohibitive cost precludes use of antiretroviral drugs on a mass scale in management of HIV infection in developing countries, Use is limited to:
- Prevent perinatal transmission

Post exposure prophylaxis in case of occupational exposure of health care worker

Administration of Antiretroviral Therapy:

- Antiretroviral therapy is available in the form of multi drug regimen known as “HAART” (Highly Active Anti retroviral Therapy) also called “Triple Therapy

Goals:

To achieve maximal and durable suppression of viral

Load

Restoration

Preservation of immunologic function

Improvement in quality of life

- Reduction of HIV-related morbidity and mortality Goals are achieved by maximizing adherence to antiretroviral regimented
- A typical starting HAART regimen consists of two nucleoside reverse-transcriptase inhibitors (NRTI)Either
- Nonnucleoside reverse-transcriptase inhibitor(NNRTI)
- Protease inhibitor (PI)
- Regimen should be designed by practitioner
- Common antiretroviral drugs:

NRTI:

*Zidovudine

*Lamivudine

*Stavudine

*Emtricitabine

* Abacavir *Zalcitabine NNRTI:

*Efavirenz

*Nevirapine

*Protease Inhibitor

*Nelfinavir

*Saquinavir

* Indinavir

*Aprenuvir.

*Fosamprenavir

*Lopinavir,

*Atazanavir Ritonavir Fusion Inhibitor

*Enfuvirtide

HIV and Health Care Worker:

Standard precautions used:

- Hand washing before and after each patient contact Use of personal protective equipment – gloves, gowns.

Eye shields and masks.

- Health care worker (HCW) can get exposed to ucciden- total parenteral exposure to HIV infected person by:
- Needle stick injury Contact with fluid or blood of infected person
- Percutaneous injury

. If this happens immediate PEP (Post exposure prophy Taxis) should be done Tab Zidovudine (300 mg) and Lamivudine (150 mg

Within 2 hours, daily for 4 weeks,

- Objective: PEP is to prevent HIV infection of cells.

Prevention of Parent to Child Transmission (PPTCT):

Overall risk of transmission of HIV from mother to her Child is 15%-25%

Obstetric practice that reduce the risk of mother to child transmission:

- Avoiding early rupture of membranes

. Avoid routine episiotomies

- Using nontraumatizing suction cups on vacuum ex tractors where possible
- Avoiding fetal scalp puncture Administration of antiretroviral agent such as zidovu dine during labour and delivery and to newborns decreased two-thirds of cases

HIV Infected Couple/Discordant Couples:

Discordant couple are those in which either wife or husband is infected while another partner remains HIV -ve HIV infected couple or discordant couple is advised to practice safer sex

- They are advised to adopt child instead of giving birth If they want to have their own baby, risk of cross-infection can be minimized by limiting unprotected inter course to most fertile period

Safer Sex:

- Safer sex avoids passing on HIV infection to others and reduce risk of contracting other STIS One partner can reinfect the other with a strain of HIV which is resistant to some treatments
- Unprotected sex can also lead to other STI and even genital cancer

Nutrition in HIV/AIDS:

Nutrition is important to people with HIV infection in two ways:

- HIV +ve individual should take a well balanced diet

*To ensure that one gets all essential nutrients that

Body needs .

*They should avoid infections that come through con terminated food and drink

- Needs to observe good hygiene when preparing food, avoid raw eggs, avoid partially cooked meat, fish etc.

12. (a) Explain the epidemiology factor in causation of TB. (b) Discuss the role of nurse in prevention of TB. (c) Describe the nurse's responsibility in implementing DOTS therapy.

Ans.

Tuberculosis:

It is specific infectious disease caused by M. Tuberculosis, which primarily affects lungs and causes pulmonary tuberculosis.

(a) Epidemiological Factors

Agent:

Mycobacterium tuberculosis i.e.

- Slender, straight or slightly curved bacilli with rounded ends
- Measures 1-4 X 0.2-0.8 microns
- Bacilli -
- Acid fast
- Non sporing
- Noncapsulated
- Nonmotile

Source of Infection:

Human and bovine:

- Bovine is of no problem in India because people take boiled milk
- Infective material is the sputum of patient
- Communicability is as long as bacilli are excreted by infected host

Host Factor:

Age:

- Can occur at any age
- Majority of cases 20-40 years
- Prevalence is higher in elder age group

Sex:

- More in males than females
- More prevalent among over 40 years
- Affect all races

Nutrition:

- Studies show that diet has no discernible influence on recovery of patients

Immunity:

- There is no inherited immunity against the disease

- It is acquired as a result of natural infection or BCG vaccine
- It breaks down in face of heavy superinfection

Environmental Factors:

- Standard of living is a related factor with occurrence disease and social factors:
- Overcrowding insanitary

. • Poverty

- Malnutrition: predisposes the disease

•Industrialization: responsible for high incidence

- Large families: chance of contact• Occupation:
  - Doctor
  - Nurses
  - Student of medical field

• Lack of Education: leads to ignorance about health

(b) Prevention and Control of TB

It mainly include following steps:

1. Early detection of case
2. Chemotherapy
3. Disinfection
4. BCG vaccination

1. Early detection of case:

Case: whose sputum is +ve for tubercle bacilli

Suspects: all others remaining

Case Finding Tools are

(1)Sputum Examination:

- Two consecutive specimens (on the spot, over night)

- For following symptoms:
    - Cough more than 2 weeks duration
    - Chest pain
    - Haemoptysis - spitting of blood

(iii) MMR (Mass Miniature Radiography):

(iv) Tuberculin Test:

- One tuberculin test unit is equal to 0.00002 mg
- Old tuberculin is replaced by PPD
- Given by intradermal route

(v) Mantoux Test:

- PPD injection 1 tuberculin unit (TU) to forearm results in red papule after 72 hours
- Palpable oedema or induration more than 10 mm in longitudinal diameter is considered acceptable infection with bacilli

Social Customs:

- Habits of indiscriminate spitting
- Use of common hookah
- Feeding habits in same utensils
- Purdah system

•Early marriages

- Repeated pregnancies
- Frequent motherhood
- People hide disease due to social stigma

Economic Status:

- TB is a chronic disease, which brings a large quantum of human suffering and a great economic loss
- Mass treatment by government is not possible due to high cost.

Mode of Transmission:

- Droplet infection and nuclei generated by an open case

•Inhalation of fine dust containing tubercle bacilli from infected sputum

- Ingestion of contaminated food and milk

Examination of Chest:

•Expensive

- More sensitive and specific like sputum examination

Chemotherapy:

Antitubercular drugs:

R Rifampicin

I Isoniazid

P Pyrazinamide

E Ethambutol

S Streptomycin

Dose Strengths as follows:

Thrice a week:

- Isoniazid - 600 mg
- Rifampicin - 450 mg
- Pyrazinamide - 1500 mg
- Ethambutol - 1200 mg
- Streptomycin - 0.75 g Disinfection:

Disinfection of sputum and infective articles to avoid spread of infection to other persons.

BCG Vaccination:

- Aim: to induce a benign, artificial primary infection, which will stimulate an acquired resistance to possibly subsequent infection
- BCG vaccine consists of live attenuated bovine strain of tubercle bacilli
- Type: liquid or freeze dried
- Administration: intradermal with 1 cm steel needle 26 gauge
- .As soon as birth, young adult, hospital nursing staff, medical students also to be inoculated

Phenomenon After Vaccination:

- About 2-3 weeks after a papule develops
- Increase in size
- Reaches a diameter of about 5 mm in 5 weeks
- It then either subsides or breaks into shallow ulcer, which heals leaving a tiny scar

Complications:

- Slight enlargement of regional lymph gland
- Left arm used for vaccination and for 6 months no other injections

Immunity:

- Protection rate 80% lasting for 10 years
- No influence on mortality

No Specific Allergy:

- Natural vaccination

Direct BCG:

- 0-2 age groups are covered by prior tuberculin test Small Pox and BCG Combined:
- May be given at the same time, but on different arms

Duration of TB:

- Minimum period of treatment is 12 months
- Optimum period of treatment is 18 months
- Beyond 2 years, it does not have advantage

(c) DOTS

DOTS - directly observed treatment short course.

It is a systemic strategy under RNTCP comprising five components.

1. Political and administrative commitment
2. Good quality diagnosis
3. Good quality drugs
4. Directly observed treatment
5. Systematic monitoring and accountability

Role of Nurse in DOTS Implementation:

. • Educating community people

- Maintaining patients with +ve TB

. •Infection-free procedure, i.e. sputum collection

- Maintaining hygiene
- Care giving
- Observation of complication
- Recording and reporting

1. Educating Community People:

- For the better achievement of goal of programme people should be made aware of the importance of programme
- By the help of various methods such as health education and skit, community people are made aware about the programme

- If needed nurse (community nurses) visits the houses for awareness of DOTS programme

2. Maintenance of TB patient:

- During programme diagnosis is done on the basis of sputum examination or other test
- Patient suffering from TB is kept apart at separate place to prevent infection to other patients • Personal protective equipment such as mask are provided to prevent droplet infection

3. Maintaining Hygiene:

- TB is a very infectious disease and during this programme both infected and noninfected person visit
- To prevent cross-infection, hygiene is maintained by making availability of personal care equipment
- All material or equipment used are kept properly to prevent infection
- Separate rooms are provided for infected patients

4. Infection-Free Procedure:

    - During the procedure of sputum collection, it is very easy to transmit infection to health care worker
    - To prevent that transmission all the equipment are kept sterile and personal protective equipment are provided to health care workers such as gloves and masks.
    - Procedure is done in a systemic way to prevent infection

5. Care Giving:

- Patients who are severely infected or suffering from any diseases are immediately given treatment
- If there is any injury or needle stick injury immediate treatment is provided
- Medications such as antitubercular are provided

6. Observation of Complication:

- After providing the medication, nurse observes the patient for any complication or any unwanted sign and symptoms

- If found any sign, immediately stop medication and consult the physician
- Nurse guides the patient to inform immediately if they found any complication or unwanted signs

7. Recording and Reporting:

- Proper records are maintained by the nurse during the programme
- All the reports and records of all people are submitted to the in-charge after the programme
- All details are collected by the nurse to help the patient for treatment so that contact should be made to any infected person when needed.

13. (a) Explain multifactorial causation of HTN. (b) Discuss the preventive measures ap plied to prevent the disease in prepathogenesis phase.

(a) Hypertension

It is the chronic condition in which the BP rises above the normal range, i.e. 120/80 mm Hg.

Classification:

Category.

Normal	-- systolic.	----Diasystolic
Pre- HTN.	-- <120.	– 80
HTN.	– 140-159.	– 90-99
Stage 1.	>= 160.	>=100
Stage 2.	-----.	-----

Risk Factors:

According to WHO

- Nonmodifiable

- Age
- Sex
- Genetic factor
- Ethnicity

- **Modifiable**
- Obesity
- Salt intake
- Saturated fat
- Dietary fibre
- Alcohol
- Heart rate
- Physical activity
- Environmental stress
- Socioeconomic status
- Others

Nonmodifiable:

1. Age:

•BP rises with age in both sexes and the rise is greater in those with higher initial BP. Communities with calorie and salt intake at subsistence level are identified whose mean BP does not rise with age.

2. Sex:

- In early ages, there is little evidence of difference in BP in both sexes.
    - Difference is most evident in young and middle-aged adults

3. Genetic Factor:

- Genetic factor gives a strong relation with HTN
- Evidence is based on twin and family study
    - BP of monozygotic twins is strongly correlated• Family study: 45% chance of HTN in children of two hypertensive parents

4. Ethnicity:

- Population study: black communities have higher BP than other groups
    - Black Americans of Africa have been demonstrated to have higher BP level than Whitesz

Modifiable:

1. Obesity:

• Greater the weight gain, greater the risk of high BP • Data also indicate that when people with high BP lose weight their BP generally decreases .

2. Salt Intake:

• It is evidenced that the increasing high salt intake (7-8 g per day) increases BP • Higher incidence of HTN is found in Japan where sodium intake is above 400 mmol/day.

3. Saturated Fat:

• It is evidenced that saturated fat increases the BP as well as serum cholesterol

4. Dietary Fibre:

- Most fibres reduce plasma total and Low Density Lipoprotein (LDL) cholesterol
- Several studies indicate that the risk of CHD and

HTN is inversely related to the consumption of dietary fibre

5. Alcohol:

- High alcohol intake increases BP
- Mainly alcohol induce high raise in systolic pres- sure as compared to diastolic

- Alcohol-induced elevation may not be fixed, it will retum to normal

6. Heart Rate:

• Study on groups of normotensive and untreated hypertensive subjects, matched for age and sex showed:

-- Heart rate of hypertensive group is invariably higher.

-- This may reflect a resetting of sympathetic activity at a higher level

7. Physical Activity:

•Physical activity plays an indirect role on reducing BP by reducing the weight

8. Environmental Stress:

- HTN itself implies a disorder initiated by tension or stress
- Psychosocial factors operate through mental pro cesses, consciously or unconsciously, to produce HTN

9. Socioeconomic Status:

- Countries in post-transitional stage: higher BP in lower-economic groups
- Societies that are transitional or pretransitional stage: higher prevalence of HTN in upper socioeco nomic groups.

10. Others:

- Oral contraception
- Noise
- Vibration
- Temperature
- Humidity

(b) Prevention

WHO has recommended the following approaches in the prevention of HTN:

- **Primary Prevention (Prepathogenesis)**

- Population strategy
  - High-risk strategy
  - **Secondary Prevention (Pathogenesis)**

Primary Prevention:

- Defined as all measures to reduce the incidence of disease in a population by reducing the risk of onset.
- WHO recommended population strategy, group strategy, complementary .

Population Strategy:

- It is directed towards the whole population and not to any of the individual
- This approach is based on the fact that even a small reduction in average BP of a population would produce a large reduction in incidence of cardiovascular compli cation such as stroke and CHD
  - Goal: to shift community distribution of BP lower levels of 'biological normality

Interventions Include:

(a) Nutrition:

Nutrition or dietary changes play an important role. This includes:

- Reduction of salt intake to an average of not more than 5 g per day
- Moderate fat intake
- Avoidance of high alcohol intake
- Restriction of energy intake more than appropriate to body needs .

(b) Weight Reduction:

- Prevention and correction of overweight/obesity is a prudent way of reducing the risk of HTN and indirectly CHD.
- It can be achieved by dietary changes**(c) Exercise Promotion:**
- It is evidenced that the physical activity leads to fall in body weight, blood lipids and BP

• It is suggested as a way of reducing the risk factor of HTN and various cardiovascular diseases

(d) Behavioural Changes:

- Reduction of stress, smoking and alcohol consumption
- Modification of lifestyle, yoga, transcendental med itation

• Both changes would be beneficial in reducing risk factor of various cardiovascular diseases.

(e) Health Education:

- General public enquire preventive advice on all risk factors

• Whole community must be mobilized and made aware about the possible primary prevention

(f) Self-Care:

Aim

• Patient is made aware to take his own BP and record in a log-book.

• To reduce the dependence on health services for normal check-up

High-Risk Strategy:

Aim:

• To prevent the attainment of levels of BP at which the institution of treatment would be considered.

- This approach is appropriate if risk factor occurs with very low prevalence in community Detection of high risk subjects by optimum use of clinical method

- Family history of HTN and tracking of BP from childhood may be used to identify individual at risk.