

Lesson Plan on common health problems of toddler

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Child health nursing

Bachelor of Nursing in Science



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6.3 Health problems during Toddlerhood period

Tetanus

Definition: Tetanus is an acute and highly fatal disease induced by the exotoxin of clostridium tetani, which is a spore forming bacteria and characterized by a prolonged contraction of skeletal muscle fibers. It is also called lockjaw. The spores c.tetani are highly resistant and can survive in soil and dust for years.

epidemiology:

Tetanus is an international health problem, as spores are found everywhere. The disease occurs almost exclusively in person who are unvaccinated or inadequately immunized.

More common in developing and under developing countries.

Types of tetanus:

1. generalized tetanus: most common and severe forms and affects all the skeletal muscles.
2. local tetanus: manifests with muscle spasm at or near the infected wound
3. cephalic tetanus: affects one or more muscles in face in 2 or 2 days after a head injury or ear infection. Lockjaw occur that can easily progress to generalized tetanus.

4. Neonatal tetanus: most common and severe forms and affects all the skeletal muscles which affects the neonate.

Incubation period:

Usually incubation period ranges from 3-21 days but can range from the day of injury to several months.

Average incubation period is 10 days.

Etiology: tetanus is caused by clostridium tetani bacterium. c. tetani spores are able to survive for a long time outside the body. They are most commonly found in animal manure and contaminated soil, but may exist virtually anywhere.

c.tetani can enter the body by any of the following:

1. animal bites
2. skin burns
3. abrasions and lacerations
4. injecting drug with dirty needles
5. tattoos that are performed with unsterilized equipment
6. body piercing performed with dirty equipment
7. circumcision

pathophysiology:

1. clostridium tetani enters the body



2. multiplication and release of tetanospasmin
(neurotoxin) ↓
3. tetanospasmin interferes with the signals sent from
the brain ↓
4. muscles spasms and stiffness
↓
5. symptoms of tetanus

Clinical manifestations:

- symptoms usually emerge about 10 days after initial_infections. However, this can vary from 4 days to about 3 weeks and in some cases may take months.
- The patients may have muscle spasms and muscular rigidity.
- Stiffness usually starts with the chewing muscles, so the patient has lockjaw.
- Muscle spasms then spread to the neck and throat, causing dysphagia.
- Breathing difficulties may result from neck and chest muscles stiffness.
- In some cases, abdominal and limb muscles are also affected.

- In severe cases, the spine will arch backwards as the back muscles are affected and this is more common when the children are infected.
- Unexplained crying, refusal of feeds and apathy.
- Death may be due to respiratory failure.

Diagnostic evaluations:

- history taking
- physical examination: a clinical test named “spatula test for the tetanus involves touching the posterior pharyngeal wall with a sterile, soft tipped instrument, and observing the effect. A positive result of the test is the involuntary contractions of the jaw and a negative result would normally cause gag reflex attempting to expel the foreign object.
- There are no currently blood tests for diagnosing tetanus.

Medical management:

Physician may prescribe penicillin and metronidazole for the tetanus treatment. These antibiotics prevent the bacterium, from multiplying and producing the neurotoxin that causes muscles

spasms and stiffness. Patient who are allergics to penicillin and metronidazole may be given tetracycline. For the management of muscle spasm and stiffness, the patients may be prescribed the following:

1. Anticonvulsants- treat muscle spasm eg. Phenobarbital, diazepam
2. Muscle relaxant- these drugs help to ease the symptoms of muscles stiffness and spasms.eg. baclofen
3. Neuromuscular blocking agents- blocks the signals from nerves to muscles fibers and are useful in controlling muscles spasms. eg. Vecuronium
4. Nutrition- patient with tetanus requires a high daily calories intake because of increased muscle activity.
5. Ventilators- some patient may need ventilator supports to help with the breathing if their vocal cords or respiratory muscles are affected.

Nursing management :

- Monitor the vital signs
- Clear airway by adjusting the position of the head extension
- Auscultate breath sounds every 2-4 hours.

- Clear the mouth and respiratory tract
- Provide oxygen as per physician's order
- Monitor the onset of respiratory failure
- Provide medications as ordered
- Provide bed rest
- Provide a non-stimulating atmosphere to promote comfort

Control and Prevention:

- Tetanus is vaccine preventable disease.
Vaccination for child (pentavalent vaccine)
- Vaccinations to pregnant women (TD). Early treatment of wound/ injury and give injection tetanus toxoid.
- Use of early antibiotics.
- Clean delivery
- Give proper health education about tetanus such as preventive measures, effects etc.

Complications:

- If the patient does not receive treatment, the risk of life threatening conditions may arise. Most patients will have bloody stools, diarrhea, fever, headache, sensitivity to touch sweating, and tachycardia.
Acute asphyxia

- Aspiration pneumonia
- Respiratory arrest
- Vertebral fracture
- Laceration of tongue, lips, buccal cavity

HIV/AIDS:

AIDS is a chronic, potentially life-threatening condition caused by the Human Immunodeficiency Virus (HIV). children are innocent victim of HIV/AIDS. HIV infection leads to Acquired Immune-Deficiency Syndrome (AIDS). It is viral infection caused by RNA virus of retro-virus family. By damaging immune system, HIV interfere with body's ability to fight with organisms that caused disease. It is fatal illness and a pandemic disease with large number of infected children throughout the world. HIV infection for infected, children and adolescents is represented by a continuum of immunologic and clinical classifications ranging from no to severe immunologic suppression and asymptomatic to severely symptomatic.

causes:

AIDS is caused by retro virus namely HIV or lymphadenopathy Associated Virus (LAS) or Human T-lymphotropic virus type III (HLV-III). HIV is a

protein capsulated RNA virus of retrovirus family. It have two sero types HIV 1 and HIV 2. HIV 1 is more pathogenic than HIV 2. HIV 1 is more pathogenic than HIV 2. Once an individual is affected, the virus remains the body for lifelong

Sources of infection:

- Infected by blood, serum and CSF (common source).
- Lower concentrations have been detected in breast milk, saliva. Tears, urine and cervical and vaginal secretions.
- Virus has also been identified in brain, tissue, lymph nodes, bone marrow and skin.

INCUBATION PERIOD:

Incubation period is uncertain. It may vary from few months to 6 years or more to develop AIDS infection. It depends upon lifestyle of the of the infected person and supportive care.

MODES OF TRANSMISSION:

- Parents to child transmission is major concern in pediatric HIV/AIDS.
 - Vertical transmission is major concern in pediatric HIV/AIDS.

- Transmission may occurs in the uterus during pregnancy, labour, delivery and breast feeding.
- Transmission through blood transfusion.
- Transmission through organ transplantation, contaminated needle prick, use of contaminated instruments during ear piercing, tattooing, acupuncture and circumcision.
- Transmission through injecting drugs especially young people on the street.
- Transmission through sexual route in adolescents and adult.
- Transmission through sexual abuse and rape especially in children.

HIV is not transmitted by food, water, mosquito bite, casual contact like social kissing, hand shaking, hugging, sharing, hugging, sharing, feeding articles, using public toilets etc.

Pathophysiology:

Transmission of HIV



HIV infection is primarily the immune system disorder with depletion of CD4 and helper T- Lymphocytes



HIV selectively infects the T- helper cell and other several cells in the immune system (B cells, macrophages, nerve cells)



Virus multiplies and the infected T helper cells are destroyed

After one to three weeks of infection there is viremia and depletion of CD4 + cells



As disease progresses, functional abnormalities of T cells may result as an abnormal response of lymphocytes to antigens, mitogens and allogeneic cells.



Failure to produce normal amounts of interleukin-2 interferons and other lymphokines



T cell defects lead to defects in B cell activity resulting in polyclonal hypergammaglobulinemia (IgA, IgG, IgM) leads to failure to form antibody to antigens.



Disturbance of complement and phagocytic activity along with widespread lymphoid infiltration



Immunosuppression



Opportunistic infections usually occurs when CD4+ cells fall



Death may occurs due to infections, neoplasm and cachexia

CLINICAL PRESENTATION

At birth, HIV infected infants are generally asymptomatic. Thereafter features may present in:

- Rapid progressive (80%): symptoms seen from 3-4 months.
- Slow progressive (20%): symptoms seen as late as up to 8 years.

GENERAL FEATURES:

Infants born to mother with HIV infection present with low birth weight, growth failure, microcephaly, hepatosplenomegaly, lymphadenopathy and pneumonia, recurrent otitis media, oral thrust, chronic diarrhea, chronic parotid swelling, unexplained anemia, thrombocytopenia, weight loss, night sweats, recurrent pyrexia etc.

Adolescence above 12 years of age present with same clinical features as an adult. WHO criteria for diagnosis of childhood AIDS in developing

countries such as Nepal, India, Bangladesh are as follows:

Major criteria:

- Weight loss or abnormally slow growth.
- Chronic diarrhea for over one month.
- Prolonged or intermittent pyrexia for over one month.

Minor criteria:

- Generalized lymphadenopathy.
- Oropharyngeal candidiasis.
- Recurrent common bacterial infections.
- Persistent cough for over one month.
- Generalized dermatitis.
- Confirmed HIV infection in the mother.

Clinical staging of HIV infection in children according to WHO

WHO (2005) clinical staging of HIV infection in infants and children include four stages:

1. Clinical stage 1 (asymptomatic): this stage is asymptomatic stage but children will have persistent generalized lymphadenopathy without any known cause.
2. Clinical stage 2 (mild): during this stage, children will have enlarged liver and spleen without any known cause.
3. Clinical stage 3(moderate): during this stage child will shows unexplained persistent diarrhea, malnutrition and bacterial infections like pulmonary tuberculosis.
4. Clinical stage 4(severe): child will have severe malnutrition, recurrent bacterial infections, candidiasis, HIV encephalopathy, pneumocystis

pneumonia, toxoplasmosis of the brain, Kaposi's sarcoma: these diseases are indicators of HIV to AIDS.

Diagnostic evaluation:

Maternal antibodies transmitted to fetus or child remain at significance level until 18 months. So, IgG antibody tests are not reliable indicators to detect infection in a child before 18 months of age.

So, a child less than 18 months of age:

- History taking
- Viral load test: this test can be done as polymerase chain reaction for DNA and RNA of HIV infection in infant. This test is commonly used to monitor the response of the child to antiretroviral therapy.
- Virology tests to confirm HIV infection in children much earlier than the antibody tests. Result will be positive in all infants who acquired HIV perinatally if tested at 6 weeks of age.

A child above 18 months of age:

Laboratory test include:

- ELISA (Elisa Linked Immune-sorbent assay) test: screening test for anti HIV and IgG detection.
- Western blot test is done as confirmatory test.
- CD4 cell count
- T cell ratio and T cell growth factors.
- HIV culture and HIV ANTIGEN TEST.
- Hematology: total count, differential cell counts and platelets count.

For breastfeeding children:

- Antibody or virology test must be performed at least 6 weeks after the cessations of breastfeeding for accurate diagnosis.

Management of HIV infected infants and children:

There is no curative treatment for HIV/AIDS once the disease is developed. Preventive measures are the vital aspects of managements. So children should be protected from transmitting the HIV infection from the adult. If the children become infected, early diagnosis and prompt management should be initiated. Supportive management of child with HIV/AIDS infections includes:

- Nutritional support
- Management of diarrhea, fever, cough, pain etc.
- Management of opportunistic infections.
- Family counseling and social support.

The specific therapy with antiretroviral drug is given when the children is infected. Commonly used antiretroviral drugs are :

- Nucleoside reverse transcriptase inhibitors class drugs (zidovudine, lamivudine, abacavir)
- Nonnucleoside reverse transcriptase inhibitors class drugs (nevirapine, Efavirenz)
- Protease inhibitors class drugs (atazanavir, darunavir, ritonavir)

WHO recommended first line and second line ARV regimen for infant and children:

- **First line regimen:** zidovudine/stavudine + lamivudine +nevirapine
- **Second line regimen:** abacavir + didanosine + lopirapine/nelfinavir

combination of antiretroviral with three drugs from at least two classes of drugs is used in the initial treatment of infected infants, children and adolescents that help to preserve immunity and delayed progression of disease. WHO \ recommended first line and second line ARV drugs regimen for infant and children:

Criteria for starting ARV therapy in children:

- According to the guidelines treatment should start if the child has severe symptoms and CD4 count is below 500
- Treatment response: treatment response is measure by viral load and CD4 counts. CD4 counts should be checked in every three to six months interval.

Preventive measures of HIV/AIDS:

Preventive measures are the best attempt to control the global problem of HIV/AIDS. The best means of preventive measure is health educations. Health educations should includes:

- Avoidance of risk behaviours.
- Antiretroviral treatment with combination therapy or post exposure prophylaxis.
- Specific prophylaxis for HIV manifestations is isoniazid for tuberculosis.
- Proper screening of blood and blood products and avoidance of commercial blood donations.
- Use disposable syringe and needle rather than glass one for injection or immunization, maintenance of aseptic techniques during delivery and in surgical or dental interventions.
- Precautions for exposure to body fluids.
- Motivation to avoid I/V drug abuse, unsafe sex.
- Promoting community awareness about transmission of HIV infection by unsafe practices i.e. ear-piercing circumcisions etc.
- Administrations of zidovudine prophylaxis to the infected pregnant woman and to the infants till 6 weeks of life to prevent vertical prevention.
- Post exposure prophylactic can be given with antiretroviral drugs (AZT-Azidothymidine-monotherapy) for 4 weeks within hours following accidental exposures to the virus by needle stick injury.

Nursing management of children with HIV/AIDS:

1. Assessment that should be focused on assessing child's physical, psychological, emotional problems.
2. Nursing interventions:
 - Prevent infections by adopting following practices: hand washing by health care provider and child himself, keep the child in room free from infections, maintain good and adequate nutrition, adequate rest, teach parents and child to contact with health personnel if any sign of infection develops and take medicine as per prescription.
 - Maintain adequate nutrition: high calorie, high protein diet, involve child in food selection and also provide prefer food to child, serve food in attractive manner, provide oral care and monitor child's weight regular basis.
 - Teach parents and child regarding prevention of transmission of infection to others.
 - Maintain adequate fluid and electrolytes balance during diarrhea.
 - Management of fever in time.
 - Provide space to child and parent to express their feeling.
 - Provide routine care and encourage to child involve in self-care.
 - Psychological support.
 - Is Promote peer group, family and social support and interaction.
 - Promote growth and development of the child.

TYPHOID FEVER:

Typhoid fever and paratyphoid fever (also known as enteric fever) are severe systemic illnesses. Enteric fever is an acute bacterial infection caused salmonella typhi. It is characterized by sustained fever and abdominal symptoms.

CAUSATIVE ORGANISM:

S.enterica serotype typhi/ Para typhi, a gram negative, nonlactose fermenting, flagellate bacterium.

MODE OF TRANSMISSION:

- Feco-oral route: poor water supply and sanitary conditions.
- Hand to mouth transmission: poor hand hygiene
- Oral ingestion of contaminated water, food or beverages
- Vegetables grown in sewage firm and washed in contaminated water promote transmission.

INCUBATION PERIOD:

7 to 14 days with the range of 3 days to weeks

Incubation period depends upon host factors such as age, gastric acidity, number of bacteria ingested and immunologic status.

CAUSES:

- Poor sanitary conditions
- Lack of safe drinking water
- Illiteracy
- Ignorance

PATHOPHYSIOLOGY:

Various etiological factors



Transmission is by contaminated food, unboiled milk, vegetables or water. Housefly plays a significant role by carrying bacilli from urine or stools of an active sufferer or a carrier to food.



On reaching the small intestine, the organisms penetrate the mucosa and infects the lymphoid follicles



The bacilli enter the blood stream



It is widely disseminated, especially to liver, spleen, bone marrow, gallbladder and the peyers patches of the terminal ileum



Ulceration of ileum results from shedding of intestinal lymphoid tissue by the end of second week



Additional pathologic changes include enlargement of mesenteric lymph nodes, focal necrosis of liver, splenomegaly, myocarditis, muscle degeneration and respiratory infection



Infection lead to both local and systemic immune responses

CLINICAL MANIFESTATIONS:

The clinical manifestation in children may found suddenly, through classically the onset of the disease is gradual. The child usually presents the following:

- Rapid rise of temperature
- Extreme malaise
- Loss of appetite
- Headache vomiting
- Coated tongue
- Abdominal pain and distension

When the toxemia is severe

- Diarrhea is more found then the constipation
- Abdomen found doughy, spleen is palpable 1 or 2 cm below costal margin
- Liver may also be palpable
- Typhoid rash as macular red rose spots may appear on about 6th day of illness. Rashes may appear on the trunk or visible in pigmented skin

Sometimes children may present with clinical features of bacillary dysentery, respiratory infections or meningitis along with typhoid fever.

Neonate usually present with vomiting, abdominal distension, diarrhea, fever with variable intensity, about 72 hours after birth. Other features may include

- Convulsion
- Jaundice
- Loss of appetite
- Weight loss
- Enlargement of liver

Diagnostic evaluations:

- History taking
- Physical examination
- Routine blood examinations- normal or low WBC, eosinophil counts may be low or absence
- Blood culture in first week of illness shows S.typhi in about 75% of patients.
- Widal test is positive, 60% in 2nd week and 80% in third week
- Bone marrow culture is highly sensitive(90%) for diagnosis of typhoid fever.
- Stool and urine cultures may show S.typhi after 2 weeks of illness and in suspected chronic carriers.
- Rapid serodiagnosis procedures like counter immune-electrophoresis, ELISA test and coagglutination test are the simple model specific diagnostic measures.

MANAGEMENT:

Medical management:

- Specific antimicrobial therapy for the treatment of typhoid fever in children is chloramphenicol 50 to 100mg/kg/day in 4 divided doses for 10 to 14 days. Other drug which can be used are ampicillin, amoxycillin

- The newer cephalosporins including ceftriaxone, cefoperazone are the drugs of choice 50 to 100mg/kg/day in single or two divided doses IV for 5 to 10 days.
- Symptomatic management with antibiotics, hydro therapy and maintenance of fluid and electrolyte balanced by IV fluid therapy.
- Blood transfusion may be needed in intestinal perforation or hemorrhage.

NURSING MANAGEMENT:

- Supportive nursing care is important for better prognosis.
- Bed rest
- Skin care
- Good oro-dental care
- Adequate fluid intake or IV fluid administration of prescribed drug
- Tepid sponging to treat for fever

PREVENTIVE MEASURES:

- Control of disease with improvement of sanitation
- Immunization
- Isolation of patient
- Proper disposal of stool and urine of infected person
- Disinfection of contaminated articles
- Adequate hand washing practices
- Health education

COMPLICATIONS:

- Abdominal: intestinal perforation, GI bleeding, hepatitis, cholecystitis, peritonitis, gastroenteritis, urinary tract infection, liver abscess, fatty liver, pancreatitis
- Neurological: encephalopathy, meningitis, hemiplegia, GB syndrome, problems like depression, cranial nerve involvement, psychiatric problems like depression, schizophrenia.
- Hematological: hemolytic anemia, bone marrow depression
- CVS: toxic myocarditis, pericarditis, endocarditis, venous thrombosis
- Respiratory: pneumonia, bronchitis, empyema, pulmonary infarction, pleurisy.

Post test

Fill in the blanks:

1. Tetanus is also known as _____.
2. Incubation period of tetanus is _____.

True and False:

1. HIV/AIDS is viral infection caused by RNA virus of retro-virus family _____.
2. Preventive measures are the best attempt to control the global problem of HIV/AIDS _____.

Multiple choice questions:

1. Management of HIV/AIDS includes:
 - a) Avoidance of risk behavior
 - b) Use disposable syringe
 - c) Motivation to avoid I/V drug abuse, unsafe sex.
 - d) All of the above
2. vaccine for the prevention of tetanus is
 - a) OPV vaccine
 - b) Rota vaccine
 - c) PCV
 - d) DPT vaccine

Assignment

Write short notes on

1. HIV/AIDS
2. tetanus

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